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Author(s): Robert D. King

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Root versus suffix accent in the Germanic present indicative

ROBERT D. KING

Department of Linguistics, University of Texas, Austin, Texas 78712

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The present paper is initially concerned with a rather minor problem in comparative Germanic morphology: the shape of the consonant in certain present active indicative endings. There are discrepancies among the early attested dialects in this matter, and the traditional explanation has been that one group of Germanic dialects generalized present forms with Indo-European root accent, the other group forms with Indo-European suffix accent. I show that this solution, which is widely accepted, is deficient in several respects, and I demonstrate that the problem has a correct solution with interesting consequences for historical linguistics provided we concentrate on the rules and their order of application in the grammars of the different dialects, that is, provided we attack the problem from within the framework of generative phonology.

I. THE TRADITIONAL EXPLANATION

I.1. We are initially concerned with the shape of the dental obstruent in the endings of the second and third singular and plural present indicative. The forms which provide the point of departure from this study are:¹

Table 1

	IE	Gothic	ON	OHG	OE	OS
2. sing.	-e-si	bindis	bindr	bintis	bindes	bindis
3. sing.	-e-ti	bindiþ	bindr	bintit	bindeþ	bindith
2. plu.	-e-te	bindiþ	bindeþ	bintet	bindaþ	bindath
3. plu.	-o-nti	bindand	binda	bintant	bindaþ	bindath

If, following strict application of the comparative method, as is customary in historical linguistics, we view the Germanic developments as branches on a Stammbaum deriving from the Indo-European endings, then we are forced to

[1] Certain simplifications in stating these paradigms have been made. The second singular in Old High German and Old English has *-st* in the younger documents, and Old Saxon has more frequently *-d* or *-t* in the endings for which *-th* is given. These are all clearly secondary developments which do not bear on the main questions of this paper, and they are ignored here. Also, no forms for Old Frisian are given. For present purposes they may be taken as agreeing with the Old English forms.

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the conclusion that certain of the Germanic endings must have come from voiced spirantal reflexes of the Indo-European obstruent in the ending, viz. Goth. 3. plu. *-and* (<Proto-Gmc. **-anð*) and ON 2. sing. *-r* (<Proto-Gmc. **-z*) whereas for other endings voiceless Proto-Germanic reflexes must be assumed, viz. OE *-þ*, OS *-th* (<Proto-Gmc. **-þ*) in the third singular. Old High German must be assigned to the former group provided one assumes, as seems most reasonable from written evidence in the language, that the change of Pre-OHG **d* > *t* preceded the change of Pre-OHG **þ* > *d*.

For the reasons sketched briefly in the preceding paragraph it has traditionally been assumed that Gothic, Old Norse, and Old High German had generalized Indo-European present forms in which the original accent rested on the root and not on the thematic vowel, so that Verner's Law operated on Early Proto-Gmc. **-s-* and *-þ-* in these endings to produce voiced *-z-* and *-ð-*, from which the endings stated in Table 1 are derived by well-known sound laws in the individual dialects. On the other hand, Old English, Old Saxon, and Old Frisian, which I shall henceforth refer to by the conventional cover term 'Ingvaemonic', had generalized Indo-European verb forms with accent on the thematic vowel, thus leading in this group of dialects to the voiceless spirants *-s* and *-þ*.²

This line of argument, which to my knowledge has never been contested in the literature, obtains its initial plausibility from several sources. First, Indo-European presumably had large numbers of verbs in both root-accented and suffix-accented categories, cf. Sanskrit stem classes 1-4 and 5-10, and it would not be surprising to find either type generalized throughout the present paradigm in a particular language. Second, it has usually been assumed that at least one type of Germanic verb has been inherited directly from suffix-accented Indo-European etyma. These are the aorist-presents, which have all the earmarks of original suffix accent: that is, they show reduced-grade root vocalism in the present (in contrast to the full-grade root vocalism characteristic of Germanic strong verbs), and they preserve effects of Verner's Law voicing in their root-final fricatives. Though the aorist-presents present severe problems of etymological and phonological interpretation, they have been cited, e.g. by Streitberg (1963: 291) and Wright (1907: 236), as additional analogical support for the generalization of suffix-accented etyma presumably observed in Ingvaemonic. One of the clearer cases is IE* *wik-e/o-* (Lat. *vincō*, Lith. *ap-veikiù*) 'fight, sacrifice', ON *vega*, OE *wegan*, *wigan*, OS OHG *wigand* (present participle). Suffix accent is indicated by the *-g-* (<*-h-*). It is possibly true that the evidence of the

[2] This is the explanation given or accepted in Boer (1918: 235), Dieter (1900: 380-383), Kienle (1960: 279-280), Krahe (1948: 95-97), Lehmann (1966: 21), Loewe (1911: 147-150), Prokosch (1939: 210-211), Streitberg (1963: 291), and Wilmanns (1906: 5). Hirt is silent on the question so far as I have been able to determine. I am informed by C. E. Bazell that the traditional explanation was rejected by J. R. R. Tolkien in a paper read to the Oxford Linguistic Society in 1937.

orist-presents lends credence to the generalization theory, but it should be noted that orist-present verbs are found in all Germanic dialects, not merely Ingvaemonic, so that the pressure they exerted toward generalization must be assumed equally great (or small) in all the dialects. Third and finally, Ingvaemonic is different in several striking ways from the rest of Germanic, e.g. syncretism in verb plurals, general loss of nasal before voiceless spirants, and various morphological innovations such as loss of the distinction between the dative and accusative of the first and second person pronouns. Hence, it jibes with the total linguistic picture to posit that Ingvaemonic had gone its separate way in generalizing accentual forms.

The traditional argument really comes down to this. In order to account for the obstruents in four of the present indicative endings, two sets of etyma are needed: one voiceless (for Old English, Old Saxon, and Old Frisian), one voiced (for Gothic, Old Norse, and Old High German). Indo-European itself had only one set of endings. The only sound law of any generality which produces voiceless and voiced reflexes of the same obstruent is Verner's Law, and the only way to make Verner's Law work properly in this instance is to put the accent on the suffix in Ingvaemonic, but on the root in the other Germanic dialects. Since Indo-European had both accent placements in its verbs, we are required to assume that all Germanic dialects were subjected to early and total analogical realignment of their present indicative endings according to one or the other model of accent location. We shall now investigate the details of this proposed analogical generalization and see what consequences it entails.

It is essential to distinguish between two different chronological positions of the generalization process if we are to determine with any precision what this explanation implies. It is sufficient to discuss the two cases in which (1) generalization preceded Verner's Law and the fixing of accent, and (2) Verner's Law and the fixing of accent preceded generalization.

1.2. It is not difficult to demonstrate that chronology (1) leads to incorrect results. In such a case we would have derivations like those in Table 2 for the verb **snejt-* 'to cut' in Ingvaemonic:

Table 2

	2. sing.	3. sing.	2. plu.	3. plu.
Indo-European	*snéjt-e-si	*snéjt-e-ti	*snéjt-e-te	*snéjt-o-nti
Early Proto-Germanic	snéjþisi	snéjþipi	snéjþepe	snéjþanþi
Generalization	snejþisi	snejþipi	snejþepe	snejþanþi
VL and accent fixing	snéjðisi	snéjðipi	snéjðepe	snéjðenþi

From the final line of forms in Table 2 we would obtain for, say, Old English, the principal parts **snīdan *snād snidon sniden* instead of the actually occurring

snīpan snāþ snidon sniden. Generally for Ingvaeonic this assumption would indicate only voiced root-final fricatives throughout all verb forms whose roots in Early Proto-Germanic ended in **f þ h s*. There would be, in other words, no Verner's Law alternations, no 'grammatischer Wechsel', within Ingvaeonic strong verbs; and, of course, Ingvaeonic shows exactly the same kind of voiceless/voiced alternations in its paradigms as do Old Norse and Old High German.

A second argument against this chronology of generalization is that suffix accent is almost invariably concomitant with reduced-grade vocalism. This is what we do find in the aorist-presents for which suffix accent is customarily posited. But when we examine the Ingvaeonic strong verbs, we find only the usual full-grade root vocalism characteristic of strong verbs in the other Germanic dialects. Nor are there residual traces of reduced-grade vocalism in Ingvaeonic regular strong verbs which would point back to an original ambiguity in accent location. It should be noted, however, that the absence of such residual forms is not too compelling an argument against the theory since the patterns of root vocalism were presumably well established before the generalization to suffix accent assumed here, and no one need feel constrained to accept this argument from silence. I have given it only to demonstrate that one potential source of support for this version of the generalization notion is not available.

Third, certain verbs present a dilemma if we accept this restatement of the traditional explanation. Consider the verb 'to find' in Old Saxon, which is *fīthan* in one of the major manuscripts (Heliand M) and *findan* in the other (Heliand C), cf. Holthausen (1921: 154). Under generalization of suffix accent we would have IE **péntono* > Proto-Gmc. **fīndan* > OS *findan*. This is the correct form for Heliand C as well as for Old English and Old Frisian,³ but there is no way to derive the *fīthan* of Heliand M from a suffix-accented form. It can be obtained directly from root-accented **péntono*, but then of course the consonants in the endings are wrong. Similarly, we observe too that the contract verbs of Old English and Old Frisian would be impossible under the condition of early generalization of suffix accent. The Old English verb *tēon* 'to pull' illustrates the problem. It had the principal parts *tēon tēah tugon togen*. The infinitive *tēon* can only have come from an earlier *tēohan* whose *-h-* derived from IE **-k-*, cf. Lat. *dūcō*. Under suffix accent, however, we would have had *-g-* as in the

[3] Old English and Old Frisian had only *findan*, *finda*, cf. Brunner (1965: 296–297) and Steller (1928: 61). These are the forms one expects from suffix-accented proto-forms. It is also reasonable to assume that they came from original root-accented forms, the sources of the analogy being (1) other verbs in the third ablaut series with *n* followed by a consonant, and (2) preterite plural and participial forms with *-nd-*, e.g. OE *fundon*, *funden*. Thus, while the Old English and Old Frisian forms for 'to find' MAY have come from suffix-accented ancestors, it is not implausible to assume that they came from root-accented forms (yielding *fīpan* as in Old Saxon) which were then discarded as too unusual in shape for a strong verb of class III. Their replacement, naturally enough, was a form in *-nd-*. In any case, OS *fīthan* could not possibly have come from a suffix-accented form, not even by analogy (what could it possibly have been analogous to?).

past participle, hence **tēogan*. The same reasoning leads us in other contract verbs to, for example, **flēogan* 'to flee' and **pēogan* 'to thrive' instead of the actually occurring *flēon* and *pēon*. In short, one cannot have it both ways: either Old English and Old Frisian had, prior to Verner's Law and the fixing of accent, generalized suffix accent, in which case no contract verbs are possible; or they had generalized root accent, in which case *-þ* and *-th* in the present indicative endings are impossible.

From these arguments we see that at least one possible interpretation of the traditional argument is badly in error. Analogy, which often provides an escape route in such situations, is out of the question. If Ingvaemonic had generalized suffix accent, then what could have been the model from which Ingvaemonic got its Verner's Law alternations and its full-grade strong verb roots? And if Ingvaemonic had generalized root accent, then what could have been a possible analogical source of the voiceless fricatives in the present indicative endings?

1.3. We find then that the assumption of an early (specifically, prior to Verner's Law and the fixing of accent) generalization to suffix accent in Ingvaemonic has intolerable consequences and must be rejected. Next let us pursue the implications of assuming that a generalization occurred not as early as previously assumed but later, viz. after Verner's Law and the fixing of accent.

Upon completion of these two processes, but before the splitting-up of Proto-Germanic into separate dialects, we would have two sets of endings for the second and third singular and plural present indicative. For convenience we designate these as sets A and B. Those verbs which in Indo-European had had root accent would have (neglecting thematic and final vowels) voiced obstruents: 2. sing. *-z-*, 3. sing. *-ð-*, 2. plu. *-ð-*, 3. plu. *-ð-* (set A). Verbs with original suffix accent would have voiceless obstruents: *-s-*, *-þ-*, *-þ-*, *-þ-* (set B). Roughly speaking, the bulk of the strong verbs would have set A, the majority of the weak verbs would have set B. Somewhat more precisely, set A would be suffixed to all strong verbs of classes I-IV, most strong verbs in classes V-VI, some weak verbs of class I (those corresponding to the type Sanskrit class 4, *divyāmi* 'I play'), and probably some or most of the weak verbs of class II. Set B of endings would go with the majority of weak verbs in class I (causatives in *-ėje-/-ėjo-* corresponding to Sanskrit class 10, *cōrāyāmi* 'I steal'), aorist-presents, some strong verbs of classes V-VI (those with *-jan* suffix and suffix accent), and the weak verbs of class III.⁴

Which set of endings a particular verb took would be pretty much an idiosyncratic feature of that verb, and so would (in the sense of generative grammar) have to be marked for each verb in its lexical entry. Thus, a verb taking set A of

[4] The imprecision of these statements is dictated by the etymological uncertainty of much of the Germanic verb system beyond the 'easy' cases strong I-V.

endings would have the schematic lexical entry [. . . , +Verb, +A], where the feature [+A] signals the suffixation rule which attaches the present indicative endings to choose the set A of obstruents. Likewise, a verb taking set B of endings would have the entry [. . . , +Verb, +B]. This is one possibility. In view of the fact that the two sets of endings differ only in voicing, a more direct characterization of the difference would be to attach to all verbs in the present indicative a single set of obstruents specified for all necessary phonological features except voicing. The choice between sets A and B would then be made by rules such as:

1. [+obstruent] → [+voice] / _____ #) [. . . , +strong I-IV]
2. [+obstruent] → [-voice] / _____ #) [. . . , +weak I]

(The three dots . . . cover the other specifications necessary for correct assignment of voicing in the endings, e.g. [+Verb, +present, +indicative], and the specifications [+strong I-IV] in rule 1 and [+weak I] in rule 2 are intended only as schematic references to the numerically largest classes affected by each rule.) Rule 1 is read 'The final obstruent of a verb from strong classes I-IV is voiced', and rule 2 is read 'The final obstruent of a verb from weak class I is voiceless'.

Thus, if we assume that Indo-European verbs were inherited directly into early Germanic with no analogical dislocations in place of accent, we conclude that at this early stage there were two sets of endings in the present indicative differing only as to voice. The generalization which the traditional explanation supposes then amounts to an extension of the environment of one or the other of rules 1 and 2 to include all verbs in a given dialect. Ingvaemonic dialects generalized rule 2 to all verb classes and deleted rule 1 from their grammars; the remaining dialects extended (i.e. simplified) the environment of rule 1 by suppressing the specification of verb class so that rule 1 now applies to all verbs, and rule 2 is deleted from the grammars of these dialects.

Though no one has ever stated the generalization process necessary to explain the present problems in terms like these, it seems quite likely that an explanation of this type was what they had in mind in propounding the notion that Ingvaemonic differed from the rest of Germanic in its generalization of suffix-accented forms. It also is doubtless true that this chronology of generalization relative to Verner's Law and the fixing of accent – not the chronology dealt with in section 1.2 – underlay their thinking about this problem, for the incorrectness of the latter chronology becomes readily apparent upon closer investigation.

This second version of the generalization process as sketched above does not get us into trouble as did the assumption of early generalization, and I see no reason to reject it out of hand. It does, however, have flaws which make it unconvincing in several respects. From a procedural point of view we note that it

solves exactly one problem – the shape of the obstruents in present indicative endings. In no other instance is the assumption that Ingvaenic and Ingvaenic alone generalized suffix accent subsequent to Verner's Law and the fixing of accent needed to explain anything, which is to say that such an explanation is suspect on *a priori* grounds. Second, there is a closely related problem which this explanation does nothing to clarify, viz. the retention of *-s* in the second singular present indicative of Old High German. As we have seen, the traditional explanation places Old High German among the dialects which generalized root-accented forms. This must be done in order to account for *-t* in the third singular and second plural as well as the third plural. This assumption, however, makes OHG 2. sing. *-s* inexplicable, for with root accent we would obtain in the second singular **némesi* > **nimiz* > OHG **nimi*. It is widely assumed that final *-z* disappeared in West Germanic, cf. Prokosch (1939: 140, 210), so that the actual Old High German form *nimis* 'thou takest' cannot have come from an original root-accented form by regular phonological development. Therefore, under the traditional explanation, extraneous and completely *ad hoc* means must be adduced to explain the retention of OHG 2. sing. *-s*.

1.4. In the preceding sections we have examined the two possible interpretations of the commonly accepted explanation, and we have shown that the first is definitely incompatible with the data. The second interpretation is not demonstrably false, but its lack of generality renders it at least mildly implausible. If a solution with less *ad hoc* character which explains more can be found, then such an explanation will merit our serious consideration. At this point the problem which initiated this study still remains: how do we account for the fact that two groups of Germanic dialects had different sets of obstruents in the present indicative endings whereas Indo-European had only one? In the following section I shall attempt to demonstrate that this problem has a natural solution provided we exchange the conception of comparative linguistics implicit in all the foregoing for one incorporated within generative grammar, and I shall show, moreover, that this explanation will automatically account for the retention of OHG 2. sing. *-s*. In addition, I shall show that the proposed explanation is compatible with certain claims made recently in regard to one type of sound change, namely rule reordering.

2. THE PROPOSED EXPLANATION

2.1. It is apparent that the problem which has here engaged our attention cannot be resolved by the positing of regular sound laws. This forces us to resort to analogy in order to describe the facts correctly, and we have seen that it is possible to do this in a fairly plausible way, though with not much generality. In other words, we have practised comparative (and, more generally, historical) linguistics within a tradition well established by the end of the nineteenth century

and continued with no major modification in principle by modern structural linguistics.⁵ We have regarded the sounds of the Germanic dialects as nodes on a Stammbaum deriving from the reconstructed Indo-European parent language, and since no reasonable sound law is available to account for the branching which now occupies our attention, we have had to seek a solution in analogy. We might further inquire into the possibility that a combination of Stammbaum and Wave Theory might provide a way out without resorting to an unparalleled generalization in the three dialects of Ingvaenic. I shall discuss this later (section 3.1) and probe its effectiveness. For the present, suffice it to say that no one has to my knowledge ever proposed any such Stammbaum and Wave Theory approach to the present problem; and it seems, moreover, dubious that such an explanation would permit us to dispense entirely with analogy.

Without delving any further into the potentialities of traditional historical and comparative linguistics in coming to grips with our problem, let us shift points of view about what historical linguistics should be concerned with and see whether a way out of our dilemma presents itself. Instead of concentrating on sound correspondences between parent language and dialect or between dialect and dialect, let us devote our attention to the grammars of the various Germanic dialects – that is, let us focus on the ordered set of statements which account for the data rather than on the data itself and its correspondences with data from other dialects. This is tantamount to a restatement of at least some of the goals of historical linguistics – a restatement which follows immediately from more general considerations concerning the goals of linguistic inquiry as proposed, say, in Chomsky & Halle (1965: 99–106).

The advantages of regarding descriptively adequate grammars and the rules they contain as the paramount goals of linguistic investigation have been argued for in numerous recent publications, and the obvious extension to historical linguistics need not detain us here.⁶ In one case discussed in print, Keyser (1963) has shown that the differences and latent likenesses among four dialects of American English cannot be characterized in any meaningful way within descriptive linguistics, e.g. by comparing phonemic inventories or phonemic and allophonic correspondences. It is possible to show, however, that a satisfactory and non-biased dialect comparison emerges from a consideration of the grammars of the four dialects and the rules contained in these grammars. The pertinent rules are:

[5] One should in fairness not construe this as implying that modern structuralism has done nothing to improve upon the earlier position secured by the Neo-Grammarians. On the contrary, a fair amount of increased precision has been brought to the subject by some of the methods of modern structuralism, see for example Hoeningwald (1950). But I stand by the observation that historical linguistics as practised by a European structuralist or an American descriptivist is in no substantive point different from that practised prior to, say, the First World War.

[6] This extension underlies a considerable part of the work currently being done in historical linguistics, e.g. Harms (1967*a, b*) Kiparsky (1966, 1967*a, b*).

3. $a \rightarrow \text{ə}$ before a vowel followed by a voiceless consonant
4. $a \rightarrow \text{æ}$ before u

The Charleston dialect has rule 3 in its grammar, the New Bern dialect has rule 4 in its grammar, the Winchester dialect has rule 3 followed by rule 4, and the dialect from around Roanoke has rule 4 followed by rule 3. We shall see that the problem under study here can be dealt with in a parallel way.

2.2. Consider the three rules:

- A. $\bar{b} \bar{d} \bar{g} > b d g$ initially, after nasals, and in gemination.
- B. Fricatives are devoiced word-finally.
- C. $z > R$ (rhotacism).

Since modifications of these rules will enter into the discussion to follow, I state them here in distinctive feature notation.⁷

$$\begin{array}{l}
 \text{A. } \left[\begin{array}{l} + \text{obstruent} \\ + \text{voice} \\ - \text{strident} \\ \alpha \text{ diffuse} \\ \beta \text{ grave} \end{array} \right] \rightarrow [- \text{continuant}] / \left\{ \begin{array}{l} \left\{ \begin{array}{l} \# \\ [- \text{obstruent}] \\ [- \text{vocalic}] \end{array} \right\} \text{---} \\ \left[\begin{array}{l} + \text{obstruent} \\ + \text{voice} \\ - \text{strident} \\ \alpha \text{ diffuse} \\ \beta \text{ grave} \end{array} \right] \end{array} \right\} \\
 \\
 \text{B. } \left[\begin{array}{l} + \text{obstruent} \\ + \text{continuant} \end{array} \right] \rightarrow [- \text{voice}] / \text{---} \# \\
 \\
 \text{C. } \left[\begin{array}{l} + \text{consonantal} \\ + \text{voice} \\ + \text{strident} \end{array} \right] \rightarrow [+ \text{vocalic}]
 \end{array}$$

As we shall see shortly, the problem of the present indicative endings can be solved by ordering some or all of these rules differently in the grammars of the early Germanic dialects. Our immediate concern, however, is to motivate the inclusion of these rules in the synchronic grammars of the Germanic dialects. This is a crucial point, for if we deal – as we do here – with grammars, we must be certain that the rules posited for these grammars functioned as synchronic rules and were not ‘sound changes’ without persistent synchronic import.

[7] In the third sub-environment in rule A I use a convention proposed by Bach (1966). His proposal is that two rules $A \rightarrow B/_-C$ and $A \rightarrow B/C_-$ be collapsed into a single rule $A \rightarrow B/C$. The purpose of this is to capture the ‘either before or after’ generalization relevant in many situations.

By way of illustration the Great Vowel Shift of Early Modern English was an innovation (i.e. addition of a rule) which happens to have had a persistent life. Its synchronic counterpart is present in the grammar of contemporary English, accounting for (among other things) *ai/i* alternations of the type *divine/divinity*. The Grimm's Law sound change $b^h d^h g^h > \bar{b} \bar{d} \bar{g}$ was likewise an addition of a rule to the grammar which happens not to have survived as a synchronic rule in the grammar of any Germanic dialect.

Certain of rules A, B, C have historical importance; for example, rule C sets off North and West Germanic against Gothic. It is not generally appreciated that these 'sound changes' also functioned as rules in the grammars of earliest Germanic.

Consider rule B. It is well known that Gothic, Old Norse, Old English, and Old Saxon had synchronic final devoicing affecting at least fricatives and in some instances – notably in later Old English and later Old Saxon – also voiced stops.⁸ The latter cases illustrate common phenomena in the histories of individual languages and in rule-borrowing, viz. that rules become generalized from earlier restricted versions of these rules. In terms of generative phonology this is reflected by simplification of a rule already in the grammar. Here, the rule in the grammars of later Old English and Old Saxon had the more general form

B'. [+obstruent] → [–voice]/ ____ #

i.e. any obstruent, whether fricative or stop, is devoiced in word-final position.

In Old High German final devoicing is less obvious because of the early change of Proto-Gmc. $*\bar{b} \bar{d} \bar{g} > b d g$ in most Old High German dialects, leaving \varkappa (<IE *s) as the only voiced fricative. It is nevertheless clear that some of the Old High German dialects had a final devoicing rule of a domain which is hard to determine (i.e. either fricatives alone or both stops and fricatives). In East and Rhine Franconian rule B had been generalized to rule B', cf. Braune & Mitzka (1959: 123–124), and in Middle Franconian, which resembles Ingvaemonic in that it preserves spirantal reflexes of Proto-Gmc. $*\bar{b} \bar{d} \bar{g}$, rule B is very much in evidence at least for the velars, cf. Braune & Mitzka (1959: 138). In Middle High German rule B' is present, e.g. *tac/tage* 'day, days', *gap/gāben* '(he) gave, (they) gave', *snidan/sneit* 'to cut, (he) cut', and this version of the rule is present in the grammar of Modern Standard German. From this process of generalization it seems reasonable to conclude that the grammar of Pre-Old High German contained rule B, as did the grammars of the other dialects.

In order to motivate the inclusion of rules A and C in the grammars of the early Germanic dialects, let us consider the voiceless/voiced Verner's Law alternations in strong verbs. These are:⁹

[8] For Gothic see Braune & Ebbinghaus (1961: 57), for Old Norse see Noreen (1923: 163), for Old English see Brunner (1965: 185–186), and for Old Saxon see Holthausen (1921: 77–79).

[9] The Old Norse alternations of *f/b*, *þ/d* are found only in Runic Norse. Secondary

Table 3

	Voiceless				Voiced			
Old Norse	<i>f</i>	<i>þ</i>	<i>s</i>	(<i>h</i>)	<i>b̥</i>	<i>d̥</i>	<i>r</i>	<i>g</i>
Old High German	<i>f</i>	<i>d</i>	<i>s</i>	<i>h</i>	<i>b</i>	<i>t</i>	<i>r</i>	<i>g</i>
Old English	<i>f</i>	<i>þ</i>	<i>s</i>	<i>h</i>	<i>b̥</i>	<i>d̥</i>	<i>r</i>	<i>ʒ</i>
Old Saxon	<i>f</i>	<i>þ</i>	<i>s</i>	<i>h</i>	<i>b̥</i>	<i>d̥</i>	<i>r</i>	<i>g</i>

The most economical way of accounting for these alternations is to posit for all the dialects a rule

$$5. \left[\begin{array}{l} + \text{obstruent} \\ + \text{continuant} \end{array} \right] \rightarrow [+ \text{voice}] / ([\text{---}] +) \left[\begin{array}{l} + \text{preterite plural} \\ + \text{preterite participle} \end{array} \right]$$

i.e. all fricatives are voiced in the preterite plural or preterite participle when stem-final.

In order to obtain the correct alternations in Old Norse, we need a rule which converts *z* to *R* (this *R* later merges with the *r* inherited from Indo-European), that is, rule C must be present in the grammar of Old Norse, and it must be ordered after rule 5. Since Old High German, Old English, and Old Saxon all have the *s/r* alternation, we must likewise include rule C in the grammars of these dialects. Rule C is additionally motivated by the *s/r* alternation in adjectival suffixes. These are the comparative and superlative constructions such as ON *spakr/spakastr* 'wiser, wisest', OHG *liobōro/liobōst* OE *lēofra/lēofosta* 'dearer, dearest', OS *narowora/nāhist* 'nearer, nearest'. These alternations are best accounted for by assuming underlying /z/ in the ending for both suffixes. In the superlative *z* > *s* before *t* by a general rule of voicing assimilation similar to the one in Modern Standard German which devoices, say, the *g* in *sagte* [za:ktə] '(he) said' because of the following *t* (the underlying form of *sagte* is /sAgt-/ , where /A/ is an archiphoneme unspecified for length). In all other environments *z* becomes *r*, thus providing for the *r* in the comparative suffix.

Returning again to Table 3 we observe that, after application of rule 5 and rule C, the only alternations not yet accounted for are OHG *h/g* and those in the dental order: OHG *d/t*, OE *þ/d*. We must therefore have a rule which (at least) converts the *ð* produced from *þ* by rule 5 to *d*. In the synchronic grammars of Old English and Old Saxon a related rule is present which makes any voiced fricative a stop in gemination. This will account for such alternations as those

developments in literary Old Norse have erased the oppositions. The *h* is in parentheses since it has generally disappeared, as in *tīða/togenn* 'to pull (inf. and part.)'. Similarly, the Old English alternation of *f/þ* is attested only in the older documents, though the phonetic opposition (as distinct from its orthographic representation) probably remained throughout Old English. Generally speaking, analogy and secondary developments have obscured the original alternations in all the dialects.

displayed by various forms of the verbs 'to have' and 'to live'; OE *hæbbe* OS *hebbiu* 'I have', OE *hæfde* OS *hadða* 'I had', OE *libbe* OS *libbiu* 'I live', OE *lifde* OS *libða* 'I lived'. This all brings us around to one of the classical problems in Germanic linguistics: when and in which environments Proto-Gmc. **b d g* became the stops *b d g*. Most scholars ascribe these changes to a very early stage of Proto-Germanic, and the consensus is fairly general that the environments for the changes were: initially, after nasals, and in gemination, cf. Prokosch (1939: 75) and Moulton (1954: 41-42). I assume, therefore, that rule A, which effects precisely this set of changes, was present in the earliest grammars of all the Germanic dialects. Whether it survived as a rule in later synchronic grammars in all the dialects is open to question; the evidence is that some version of rule A must be posited for the grammars of attested Old English and Old Saxon, as we see from the arguments just preceding.

In Old High German the stopping of the Proto-Germanic continuants **b d g* was an unconditioned sound change, hence I assume for the grammar of Pre-Old High German a context-free version of rule A:

$$A'. \left[\begin{array}{l} + \text{obstruent} \\ + \text{voice} \\ - \text{strident} \end{array} \right] \rightarrow [- \text{continuant}]$$

i.e. *b d g* > *b d g*. At this point the rules motivated for Old High German, specifically rules 5, A', and C, will produce the Verner's Law alternation *p/d* in the dental, non-strident set. In order to get from here to the correct alternation *d/t* (see Table 3) rules are required which change *p* > *d* and *d* > *t*. Even though the change *d* > *t* occurred earlier than *p* > *d* in Old High German, there is no reason to separate these two rules by an intervening rule or rules in the synchronic grammar of Old High German. Thus, these two rules are ordered alike with respect to all other rules in the grammar, and it seems reasonable to state them as a single rule:¹⁰

$$D. \left[\begin{array}{l} + \text{obstruent} \\ - \text{grave} \\ - \text{strident} \\ \alpha \text{ continuant} \end{array} \right] \rightarrow \left[\begin{array}{l} - \text{continuant} \\ \alpha \text{ voice} \end{array} \right]$$

2.3. The purpose of the preceding excursus was to motivate the inclusion of some or all of rules A, B, C, D in the grammars of the early Germanic dialects. Let us now return to the initial object of this investigation.

Since Indo-European had large numbers of verbs in both root-accented and suffix-accented categories, and since no single Germanic dialect shows Verner's

[10] Interestingly, the analogue of rule D is present in the grammars of certain German dialects (Becker 1967: 65).

Law traces of this difference in its present indicative endings, it is necessary to assume that some kind of coalescence of the two sets of endings occurred. Rather than follow the traditional line of reasoning and assume *ad hoc* that Ingvaenic had generalized the voiceless set, I propose that Proto-Germanic had generalized the type root-accented throughout the present indicative subsequent to Verner's Law, but before the split into dialects. This assumption gives, for the verb 'to bind' used in Table 1, the forms 2. sing. **bindiz*, 3. sing. **bindid*, 2. plu. **binded*, 3. plu. **bindand*, and I take these forms to be the correct base forms for input to the earliest grammars of the separate Germanic dialects. I propose also that these grammars contained the following rules ordered as indicated:

Gothic:	A-B
Old Norse:	A-C-B
Old High German:	A'-B-C-D
Ingvaenic:	B-A-C

Not all of the rules as shown are crucially ordered, i.e. must apply in the order stated for correct final results. The crucialness relations are as follows. In Gothic A must precede B. In Old Norse C must precede B. In Old High German A' must precede B, A' must precede D, and B must precede C. In Ingvaenic B must precede A and C.

Application of these rules in the orderings stated above leads to results which are not contradicted by any data in any of the dialects, and moreover accounts correctly for the shape of the obstruents in the present indicative endings. This is demonstrated by the derivations in Table 4.

A comparison of Table 4 with Table 1 reveals certain discrepancies. The final forms for Gothic given in Table 4 are almost correct as they stand. Only the rule raising *e* to *i* must have been added at some point to produce 2. plu. *bindip*. The situation in Old Norse is more complicated, as one would expect from the innovating character of that language. One additional rule which is needed would syncopate unstressed short vowels in a variety of environments, cf. Noreen (1923: 132-140), giving 2. sing. *bindr*. The ending of the second singular was extended to the third singular, yielding 3. sing. *bindr* in literary Old Norse. The original dentalfricative in this ending is attested in Runic Norse *bariutip* '(he) breaks' (Stentoft). The sequence *-nd* in the third plural regularly became *-nn*, which disappeared finally.¹¹ Thus, the correct form of the third plural is derived from the final form in Table 4 according to *bindand* > *bindann* > *binda*. The Old High German forms are correct as they stand. In Ingvaenic *n* was regularly lost before voiceless fricatives, thus 3. plu. *bindanþ* > *bindap*. This form was then extended over the entire plural. In Old English unstressed *i* was

[11] This is only one instance of a general assimilation rule which also carries out the changes *lp* > *ll*, *td* > *tt*, and certain kinds of regressive assimilation in Old Norse.

early reduced to *e*, though forms with *i* are well attested in the early documents, cf. Brunner (1965: 272).

We observe that one pleasing by-product of the solution proposed here is that it explains in a natural way the occurrence of the *-s* in Old High German second singular. Under the traditional explanation this should have disappeared, as was noted in section 1.3. Most scholars have attempted to explain its retention by reference to the supposedly frequent use of enclitic *þu* 'thou', i.e. *bindiz þu* > *bindisþu* with *s* now in non-final position where it normally does not disappear.

Table 4

	2. sing. <i>bindiz</i>	3. sing. <i>bindid</i>	2. plu. <i>binded</i>	3. plu. <i>bindand</i>
Gothic				
A	<i>bindiz</i>	<i>bindið</i>	<i>binedeð</i>	<i>bindand</i>
B	<i>bindis</i>	<i>bindiþ</i>	<i>bindeþ</i>	_____
Old Norse				
A	<i>bindiz</i>	<i>bindið</i>	<i>binedeð</i>	<i>bindand</i>
C	<i>bindiR</i>	_____	_____	_____
B	_____	<i>bindiþ</i>	<i>bindeþ</i>	_____
Old High German				
A'	<i>bindiz</i>	<i>bindid</i>	<i>binded</i>	<i>bindand</i>
B	<i>bindis</i>	_____	_____	_____
C	_____	_____	_____	_____
D	<i>bintis</i>	<i>bintit</i>	<i>bintet</i>	<i>bintant</i>
Ingvaenic				
B	<i>bindis</i>	<i>bindiþ</i>	<i>bindeþ</i>	<i>bindanþ</i>
A	<i>bindis</i>	<i>bindiþ</i>	<i>bindeþ</i>	<i>bindanþ</i>
C	_____	_____	_____	_____

This is the explanation given in, for example, Paul (1949: 155), Prokosch (1939: 210), Streitberg (1963: 320), and Wright (1907: 236). Actually, in spite of its wide acceptance, this explanation is strictly *ad hoc* with no basis in available fact. However, the solution proposed here accounts automatically, so to speak, for 2. sing. *-s* in Old High German as well as in Old English and Old Saxon. This can be seen from the derivations in Table 4.

3. SOME GENERAL CONSIDERATIONS

3.1. The claim implicit throughout the preceding discussion was that generative phonology has furnished us here with a solution to a problem which traditional comparative and historical linguistics could not satisfactorily solve. I shall now offer substantiation of this claim.

It was pointed out in section 2.1 that the problem of the present indicative endings cannot be solved by a traditional comparative reconstruction without resorting to an *ad hoc* generalization of suffix accent in Ingvaenic. This I regard as unsatisfactory. It was also suggested that use of some version of the Wave Theory might point a way out of the difficulty without requiring an unsupported analogy. Let us see whether we can obtain any assistance from such a procedure.

The rules and their orderings proposed in section 2.2 were rules in the synchronic grammars of the earliest Germanic dialects, and their inclusion in these grammars was motivated by appeal to various kinds of morphophonemic alternation observable in the attested forms of these dialects. One might entertain an alternative interpretation of these rules: that they were sound changes in the traditional sense of the term and that their different chronologies in the different dialects reflect the wave-like nature of their spread throughout the Germanic-speaking regions. We might then propose the following argument.

It is well known that Gothic and Old Norse had many features in common. It is therefore possible that rule A was transmitted from one to the other at an early date; it was then diffused southward to Old High German in a more general form, rule A', and to Ingvaenic, which also extended it by changing $\tilde{d} > d$ in all positions. Rule C (rhotacism) was an innovation in Nordic which was transmitted southward to Old High German and Ingvaenic. Rule B would have to be an innovation in Ingvaenic which diffused southward and northward, reaching Old High German after rule A' but before rule C, whereas it reached Old Norse after rule C and Gothic after rule A.

In principle, I see no objection to the argument just proposed. There is one point in particular, however, which makes it very unlikely – the necessity of assuming that rule B preceded rule A chronologically in Ingvaenic. Scholars are almost universally agreed in attributing rule A to Proto-Germanic, cf. Lehmann (1963: 233), Moulton (1954: 41–42), Prokosch (1939: 58). This places the time of the sound change expressed in rule A very early. Rule B, on the other hand, is not generally ascribed to Proto-Germanic, but rather is placed in the 'einzel-dialektische' period, cf. Prokosch (1939: 89–90). Traditionally, then, it has been assumed that rule A preceded rule B in chronological order, and the grammars of two of the dialects (Gothic and Old High German) crucially require the order A–B. Yet the reverse order is crucially required in Ingvaenic, so that it takes real faith in the Wave Theory to ascribe to it the different orderings needed in this explanation.

On balance I would say that this attempt to salvage a traditional explanation by pulling in the Wave Theory is even less convincing than the traditional explanation via generalization minus the Wave Theory. The solution proposed in section 2 suffers from none of the disadvantages of either. The only analogy it requires is one common to all the Germanic dialects – generalization to root-accented forms. The rules posited for the grammars of Germanic would be

present no matter whether there was a problem with the present indicative endings not. The fact that Ingvaemonic has two rules in an order not shared by the other or dialects is in no way damaging to the explanation; it is simply one more illustration of the empirical fact that the grammars of different dialects of the same language often differ in the order of application of their rules – an observation made not only by Keyser (1963) but also by Saporta (1965) and Vasiliu (1966). These are the reasons which I offer in substantiation of my claim that generative phonology provides us here with an explanation unmatched for plausibility by any method or combination of methods from more traditional historical and comparative linguistics.

3.2. The order of rules A and B in Ingvaemonic furnishes us with some data which have implications for certain interesting claims recently put forward regarding sound change. As documented in section 3.1, it does not seem reasonable to assume that the synchronic order of these rules in the grammar of Ingvaemonic (B–A) is the same as the original order. Chronologically, it is virtually certain that A occurred prior to B as a sound change (i.e. rule addition), hence it seems probable that the earliest grammar of Ingvaemonic had these rules in their chronological order A–B as did Gothic and Old High German (and Old Norse, in all likelihood). If this is true, then we have here a case of rule reordering between two chronologically distinct synchronic grammars of the same language. Such cases are by no means uncommon: they have been unearthed for Finnish and German dialects by Kiparsky (1967*b*) and for Russian by Harms (1967*b*).

Why reordering such as this takes place is an extremely interesting question. It seems highly improbable that such things ‘just happen’. Rather, one would hope and expect to find that such a datum is the consequence of some stronger, more-encompassing claim about linguistic change in general. A claim of this sort was made by Halle (1962: 64) and provides a basis for further hypotheses about rule reordering. Halle conjectured that children (and not adults) possess the ability to construct optimal (simplest) grammars on the basis of the restricted corpus of examples which they have been exposed to. Halle further proposed that some kinds of phonological change are the result of the optimization of grammars by successive generations of learners of the language – i.e. children of native speakers.

Kiparsky (1967*b*) has drawn the consequences of these conjectures in a way which provides empirical motivation for rule reorderings. His notion is that ‘Rules tend to shift into the order which allows their fullest utilization in the grammar’. More specifically, rules tend to shift into the order which maximizes the number of forms which fit the structural description of a rule at its point of application in the grammar. An example not cited by Kiparsky which illustrates the principle comes from Modern Standard German. Following an analysis suggested by Emmon Bach (in conversation) it is necessary to include in the

grammar of German a rule which specifies that vowels must be long when followed by voiced obstruents, that is:

$$6. V \rightarrow [+long] / \text{ ____ } \left[\begin{array}{l} + \text{obstruent} \\ + \text{voice} \end{array} \right]$$

Rule 6 accounts for the general fact about German that vowels followed by voiced obstruents must be long, e.g. *Hagel* [ha:gəl] 'hail', *Ader* [a:dər] 'vein'. (Exceptions to this rule are few and mostly of Low German origin, e.g. *Ebbe* 'ebb-tide'.) Also, rule 6 predicts length in vowels before voiceless obstruents which alternate in word-final position with voiced obstruents in non-final position, e.g. [lo:p]/[lo:bəs] = *Lob/Lobes* 'praise, of the praise', base form /lOb-/, where /O/ is the archiphoneme *o* not specified for length. Other examples are *Tag/Tage* 'day, days', *Rad/Räder* 'wheel, wheels', *Weg/Wege* 'path, paths'. All of these would have in their base forms a vowel unspecified for length and a voiced obstruent in stem-final position.

In order to obtain the correct voiceless final obstruents in *Lob*, *Tag*, *Rad*, *Weg*, etc., we must have a rule which devoices obstruents in word-final position, that is:

$$7. [+obstruent] \rightarrow [-voice] / \text{ ____ } \#$$

Rule 7 must apply after rule 6. We then have the typical derivations

	<i>lOb</i>	<i>lObes</i>
Rule 6	<i>lo:b</i>	<i>lo:bes</i>
Rule 7	<i>lo:p</i>	_____

(The base form given here for *Lobes* has been chosen to expedite the presentation of the analysis at hand. In the complete grammar of German the [ə] in the final form [lo:bəs] would not be derived from underlying /e/.)

The synchronic order of these two rules, 6–7, does not correspond to their historical order. Obstruent devoicing was not present in the grammar of Old High German, and it is usually put in the eleventh century. Vowel lengthening (in open syllable, as it is usually stated), post-dates Classical Middle High German, hence occurred later than the twelfth century at the earliest. The grammar of earlier German then had the order 7–6, yielding the derivations

	<i>lob</i>	<i>lobes</i>
Rule 7	<i>lo:p</i>	_____
Rule 6	_____	<i>lo:bes</i>

If we compare final forms in the two sets of derivations, we see that the *o* in *lo:p* has become long. From a traditional point of view this would be called analogical levelling under pressure from the long vowels which occur in all other forms in the paradigm. In generative phonological terms a reordering of these two rules has taken place within a later grammar of German, and it is this phenomenon

which Kiparsky (1967*b*) has proposed to explain by a tendency towards maximal utilization of rules in the grammar.

In the historical order 7-6, each rule applies to only one of two possible inputs at its point of operation. In the synchronic order, however, rule 6 has shifted into an earlier position where it operates on and changes both inputs, and rule 7 still applies to a single form. In this grammar rule 6 does more, hence has a greater utilization in the grammar. In terms of Halle's original conjectures, the child, in internalizing the grammar of his language, has optimized his version of this grammar by placing rule 6 in a position where it does more work. He has, in a sense, learned his language incorrectly – that is, his grammar of the language is not the same as that of the adult speakers who have cared for him.

This example from German is offered both as an illustration and confirmation of Kiparsky's conjectures concerning the conditions under which rule reordering takes place. If I am right in my argument that the synchronic order of rules A and B in Ingvaenic is the opposite of their historical order, then we shall see that this case too supports Kiparsky's hypothesis.¹²

Assuming that A-B is the correct order of the two rules in the earliest grammar of Ingvaenic, we obtain the sample derivations

	<i>bīndīz</i>	<i>bīndīđ</i>	<i>bīndand</i>
Rule A	<i>bindiz</i>	<i>bindīđ</i>	<i>bindand</i>
Rule B	<i>bindis</i>	<i>bindīp</i>	_____

In the synchronic order, on the other hand, we have the order B-A, thus

	<i>bīndīz</i>	<i>bīndīđ</i>	<i>bīndand</i>
Rule B	<i>bīndis</i>	<i>bīndīp</i>	<i>bīndanp</i>
Rule A	<i>bindis</i>	<i>bindīp</i>	<i>bindanp</i>

In the historical order rule A removes *bindand* as input to rule B since the latter rule applies only to final fricatives. In the synchronic order rule B has been shifted into a position which allows it to operate on *bīndand* as well as the other forms. What this demonstrates is that the explanation suggested here is a possible one in that the reordering it requires proceeds in the direction of greater optimality. If the opposite were true – if the reordering resulted in less optimality – then I would hesitate to accept the solution proposed here to the problem of the Germanic variants in the present indicative endings.

[12] An example which, on the face of it, is counter to this hypothesis is cited by Halle (1962) and taken from Joos (1942). In the grammars of certain Canadian dialects two rules are present: rule 1 states that /a/ is lowered in the diphthongs /aj/ and /aw/ before a fortis consonant; rule 2 states that /t/ becomes /d/ in intervocalic position. One group of dialects has the order 1-2, producing [təipræidər] from underlying /təjprajtVr/, the other group has the order 2-1, giving [təipraidər]. The order 1-2 is the maximally efficient order, and it would also seem to be the historical order. If this is so, then the shift to the order 2-1 represents a tendency away from optimality. This instance cannot be taken as a clear counter-example, however, until it is shown that the order 2-1 was not the original one which might have arisen in the process of rule borrowing.

REFERENCES

- Bach, E. (1966). Two proposals concerning the simplicity metric in phonology. Paper read before the Linguistic Society of America.
- Becker, D. A. (1967). Generative phonology and dialect study: an investigation of three modern German dialects. Unpublished Ph.D. dissertation. Austin, University of Texas.
- Boer, R. C. (1918). *Oergermaansch Handboek*. Haarlem: H. D. Tjeenk Willink & Zoon.
- Braune, W. & Ebbinghaus, E. A. (1961). *Gotische Grammatik*, 16th ed. Tübingen: Max Niemeyer.
- Braune, W. & Mitzka, W. (1959). *Althochdeutsche Grammatik*, 9th ed. Tübingen: Max Niemeyer.
- Brunner, K. (1965). *Altenglische Grammatik*, 3rd ed. Tübingen: Max Niemeyer.
- Chomsky, N. & Halle, M. (1965). Some controversial questions in phonological theory. *JL* 1. 97-138.
- Dieter, F. (1900). *Laut- und Formenlehre der altgermanischen Dialekte*. Leipzig: O. R. Reisland.
- Halle, M. (1962). Phonology in generative grammar. *Word* 18. 54-72.
- Harms, R. T. (1967a). Split, shift and merger in the Permic vowels. To appear in *Ural-Altaische Jahrbücher*.
- Harms, R. T. (1967b). Rev. Vahros, I. & Kahla, M. (eds.) *Lingua viget: Commentationes Slavicae in Honorem V. Kiparsky*. To appear in *The Slavic and East European Journal*.
- Hoensigwald, H. M. (1950). The principal step in comparative grammar. *Lg* 26. 357-364.
- Holthausen, F. (1921). *Altsächsisches Elementarbuch*, 2nd ed. Heidelberg: Carl Winter.
- Joos, M. (1942). A phonological dilemma in Canadian English. *Lg* 18. 141-144.
- Keyser, S. J. (1963). Rev. Kurath, H. & McDavid, Jr., R. I. *The Pronunciation of English in the Atlantic States*. *Lg* 39. 303-316.
- Kienle, R. von (1960). *Historische Laut- und Formenlehre des Deutschen*. Tübingen: Max Niemeyer.
- Kiparsky, P. (1966). Sonorant clusters in Greek. To appear in *Language*.
- Kiparsky, P. (1967a). On the history of Greek accentuation. To appear in *Langages*.
- Kiparsky, P. (1967b). Linguistic universals and linguistic change. Paper read at the Texas Conference on Language Universals.
- Krahe, H. (1948). *Germanische Sprachwissenschaft*. Berlin: Walter de Gruyter.
- Lehmann, W. P. (1963). Some phonological observations based on examination of the Germanic consonant shift. *Monatshefte* 55. 229-235.
- Lehmann, W. P. (1966). The grouping of the Germanic languages. In: Birnbaum, H. & Puhvel, J. *Ancient Indo-European Dialects*. Berkeley: University of California Press.
- Loewe, R. (1911). *Germanische Sprachwissenschaft*. Leipzig: Göschen.
- Moulton, W. G. (1954). The stops and spirants of early Germanic. *Lg* 30. 1-42.
- Noreen, A. (1923). *Altisländische und altnorwegische Grammatik*, 4th ed. Halle: Max Niemeyer.
- Paul, H. (1949). *Kurze deutsche Grammatik*. Halle: Max Niemeyer.
- Prokosch, E. (1939). *A Comparative Germanic Grammar*. Philadelphia: Linguistic Society of America.
- Saporta, S. (1965). Ordered rules, dialect differences, and historical processes. *Lg* 41. 218-224.
- Steller, W. (1928). *Abriss der altfriesischen Grammatik*. Halle: Max Niemeyer.
- Streitberg, W. (1963). *Urgermanische Grammatik*, 3rd ed. Heidelberg: Carl Winter.
- Vasiliu, E. (1966). Towards a generative phonology of Daco-Rumanian dialects. *JL* 2. 79-98.
- Wilmanns, W. (1906). *Deutsche Grammatik*. Strassburg: Karl J. Trübner.
- Wright, J. (1907). *Historical German Grammar*, 1st ed., vol. 1. Oxford: Oxford University Press.