Abstractness and Old English Phonology

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Kiparsky and O'Neil (1976)(K-O), in response to Keyser (1975)(K), propose a system of rules to account for a number of facts which characterize the phonology of Old English (OE). In responding to K, K-O set themselves two tasks. First, they wish to refute K's claim that certain deletion phenomena in OE support the existence of a highly abstract (in the sense of its being nowhere directly observable on the surface) rule of Vowel Metathesis (VM). In addition, K-O have in mind to develop a reasonably complete set of synchronic rules of OE phonology. These two aims work together to the extent that it is only by providing a more highly valued description of the OE phonological system than that advocated by K, and by showing that this description requires no rule of VM, that K-O can refute K's contention that a synchronic rule of VM is operative in OE phonology.

As regards the first of the tasks undertaken by K-O, they succeed in showing that if one considers some crucial data not taken into account by K, and if one also examines in detail the justification in K's system for the morphophonemic forms which he posits, then the evidence for a rule of VM in OE essentially disappears. Consequently, not only is K's highly abstract rule of VM suspect on theoretical grounds, but, for descriptive reasons alone, the inclusion of such a sule in the phonological component of OE is not warranted.

However, in the process of refuting K's proposed rule of VM, K-O are led to incorporate certain rather "abstract" features into their phonological account of OE. They propose, for example, a rule of Strong Marking which operates left-to-right iteratively through a string, its only effect being to mark certain vowels and glides as non-deletable. There is, in addition, a rule of Weak Deletion of such formal complexity as to, like K's VM, be suspect on theoretical grounds alone. Thus, while

the aim of K-O is to eliminate from the phonological description of OE K's abstract rule of VM, they succeed in this task only at the expense of proposing an alternative account which itself embodies a number of "abstract" characteristics. It is the purpose of this study to examine these questionable aspects of the K-O description of OE phonology, and to seek ways in which they might be eliminated.

1. High Vowel Syncope in Old English

1.1 The "Traditional Analysis"

That phenomenon central to the system of phonological rules developed by K-O is the deletion in OE of high vowels (and, in the K-O system, high glides as well) in certain phonological environments. In discussing this rather complex phenomenon, K-O first set out to determine the phonological environment which <u>precedes</u> the OE high vowel deletion site. In this endeavor they note the following dichotomy of deletion/retention environments (p. 531):

1. a. Deletion environments:

   1. $\bar{V}C$ ___ (e.g. /wīt + y + es/ ⟶ [wītes] 'punishment': g.s.)
   2. $\breve{V}C\breve{C}$ ___ (e.g. /word + u/ ⟶ [word] 'word': n.p.)
   3. $\breve{V}C\breve{V}C$ ___ (e.g. /werod + u/ ⟶ [werod] 'troop': n.p.)

   b. Retention environments:

   1. $\breve{V}C$ ___ (e.g. /hof + u/ ⟶ [hofu] 'dwelling': n.p.)
   2. $\bar{V}C\breve{V}C$ ___ (e.g. /hēafud + u/ ⟶ [hēafudu] 'head': n.p.)[1]

To account for the pattern of deletion appearing in (1a), K-O first examine a "traditional proposal" which "seems to invoke the following two rules" (p. 531-32):

2. a. $\begin{bmatrix} +\text{ high} \\ -\text{ cons} \end{bmatrix} \longrightarrow [+\text{ syll}] \;/\; \left\{ \begin{matrix} \bar{V}C \\ \breve{V}C\breve{C} \\ \breve{V}C\breve{V}C \end{matrix} \right\} \;\_\_$

   b. $\begin{bmatrix} +\text{ high} \\ -\text{ cons} \\ -\text{ stress} \end{bmatrix} \longrightarrow \emptyset \;/\; \left\{ \begin{matrix} \bar{V}C \\ \breve{V}C\breve{C} \\ \breve{V}C\breve{V}C \end{matrix} \right\} \;\_\_$

K-O, however, reject a treatment of the OE deletion phenomena exemplified in (1a) based on rules of the type appearing in (2) for three reasons. First, such an account leads, they claim, to incorrect derivations in forms in which two vowels satisfy the environmental specifications of the deletion rule given as (2b). That is, in such forms both vowels should delete. For example, a morphophonemic string such as K-O's /aedel + y + u/ should,

on the basis of (2b), come to the surface as *[aedel], "since both i (from underlying /y/ by (2a)--R.S.) and u are after two light syllables at the point when (11) (=(2b)--R.S.) applies" (p. 532). In fact, as K-O note, the observed form is [aedelu] ('noble': n.p.). The second objection which K-O have to a treatment of high vowel deletion in OE based upon rules of the form in (2) is that "the notion heavy syllable (VC and VCC) corresponds to no single formula, and the equivalence between a heavy syllable of either kind and a sequence of two light syllables (though not of a heavy syllable followed by a light) is even more problematic" (p. 532). In short, the "unnaturalness" of the environment appearing in the rules in (2) speaks against the correctness of such rules for the phonological description of OE. Finally, K-O object to the analysis portrayed in (2) on the grounds that "the same environments appear in both rules. Whatever the reason for the equivalence VC = VCC = VCVC, this combination of three environments is rare enough in languages that its repetition in two rules, especially in two adjacent rules that have the same input specification [+ high, - cons], must be considered a sign that something is seriously wrong" (p. 532). On the basis of such considerations, then, K-O dismiss the "traditional analysis" of high vowel syncope in OE.

1.2 The Kiparsky-O'Neil Solution

Having rejected the account of syncope in OE portrayed in (2), K-O then formulate an alternative system of rules. They suggest that "a possible solution that neatly eliminates these difficulties (i.e. those that characterize the rules in (2)--R.S.) is to assume that in a sequence of short vowels and glides each of which is in a weak position, every second such segment from the left is marked with a feature [+ strong]. Then deletion can simply apply to any[2] postconsonantal [- strong] segment" (p. 532-33). The two rules which K-O propose to carry out the operations described are those in (3) (p. 554):

3. a. Strong Marking (left-to-right iterative):

$$[-\text{ cons}] \longrightarrow [+\text{ strong}] \;/\; \begin{bmatrix} -\text{ cons} \\ -\text{ long} \\ -\text{ strong} \end{bmatrix} \quad \left\{ \begin{matrix} [+\text{ syll}] \\ + \end{matrix} \right\} \_\_$$

b. Weak Deletion:

$$\begin{bmatrix} -\text{ stress} \\ -\text{ cons} \\ +\text{ high} \\ -\text{ strong} \\ {}_a\langle +\text{ syll}\rangle \end{bmatrix} \longrightarrow \emptyset \;/\; C \_\_ \left\{ \begin{matrix} \langle C\rangle \begin{bmatrix} V \\ \langle -\text{ high}\rangle \end{bmatrix} \\ {}_b\langle \#\rangle \end{matrix} \right\}$$

To illustrate the operation of these rules, K-O give derivations such as those in (4) (in which * indicates a [+ strong] marking) (p. 533):[3]

4. a. /k̈un + y + u/[4] b. /w̄it + y + u/

	*		*	(3a)
	Ø		Ø	(3b)
	n		---	Gemination
cyn(n) ('race': n.s.)		w̄itu		

c. /aeđel + y + u/

	*	*	(3a)
	Ø		(3b)
	---		Gemination
aeđelu			

The environmental restrictions imposed by K-O upon their rule of Weak Deletion (3b) are illustrated in (5):

5. a. The specification: $_a\langle$+ syll$\rangle$ . . . $_b\langle$#$\rangle$: If b, then a:

/w̄it + y + Ø/	but	/wend + i + Ø/	
---		Ø	(3b)
e		---	Syll. Lowering
w̄ite		wend ('turn': 2nd s. imp.)	

b. The specification: $C\begin{bmatrix} V \\ -\text{ high} \end{bmatrix}$:

/hēafud + u/	but	/hēafud + es/	
*		*	(3a)
---		Ø	(3b)
hēafudu		hēafdes (g.s.)	

Two aspects of the restriction on Weak Deletion treated in (5b) require further consideration. First, this restriction is incorporated into the rule using angled brackets. It is one expansion of these angled brackets which appears in (5b). The alternate expansion of this restriction is that in (6):

6. $\begin{bmatrix} V \\ +\text{ high} \end{bmatrix}$

With the expansion of (3b) utilizing (6), a [- strong] segment can delete before a vowel, but only before a vowel which is [+ high]. Restricting the deletion of [- strong] segments to occurring before high vowels only is, however, factually incorrect. The fact that high vowel syncope in OE occurs before [- high] as well as [+ high] vowels has already been seen, in the derivation of [w̄ites] from /w̄it + y + es/ in (1a). Such deletion is illsutrated again in (7):

7. /wend + i + u/ but also /wend + i + an/

	*		*	(3a)
	Ø		Ø	Weak Deletion
wendu ('I turn')		wendan ('to turn')		

As the derivations in (7) indicate, Weak Deletion must be allowed to apply before a vowel regardless of its height. Rule (3b) as formulated by K-O fails to account for forms such as wītes and wendan, but can be amended to do so by replacing the bi-conditionality between C and - high with the implicational statement in (8):

8. $a\langle C\rangle \left[b\langle \overset{V}{-\text{ high}}\rangle \right]$ Condition: If a, then b.

The second consideration which must be made concerning the specification $\langle C\rangle\left[\langle \overset{V}{-\text{ high}}\rangle\right]$ incorporated by K-O into their formulation of the process of Weak Deletion involves forms such as hēafdum ('head': d.p.) and tēldun ('to blame': past pl.). These forms are derived from the underlying strings /hēafud + um/ and /tēl + i + dun/, respectively. As such forms indicate, in addition to the environments defined in (5a) and (8), Weak Deletion is also triggered by the environment appearing in (9):

9. $C \left[\overset{V}{+\text{ high}} \right] C$

Such operation of the process of Weak Deletion can be accounted for by further amending the conditioning environment defined in (8) to that in (10):

10. $a\langle C\rangle \left[b\langle \overset{V}{-\text{ high}}\rangle \right] c\langle C\rangle$ Condition: If a, then b or c.[5]

Replacing the specification $\langle C\rangle \left[\overset{V}{-\text{ high}} \right]$ in (3b) with the formula in (10) results in the descriptively adequate formulation of the process of Weak Deletion appearing in (11):

11. Weak Deletion (revised):

$$\left[\begin{array}{l} -\text{ stress} \\ -\text{ cons} \\ +\text{ high} \\ -\text{ strong} \\ a\langle +\text{ syll}\rangle \end{array} \right] \rightarrow \emptyset \;/\; C \_\_ \left\{ b\langle C\rangle \left[c\langle \overset{V}{-\text{ high}}\rangle \right] \; d\langle C\rangle \right\} \quad e\langle \#\rangle$$

Conditions: If e, then a.
If b, then c or d.

This revised rule of Weak Deletion, in conjunction with K-O's Strong Marking (3a), accounts for the high vowel syncope phenomena which characterize OE. It is the system of rules appearing in (3a) and (11) which K-O accept in place of a system founded upon a more traditional formulation such as that in (2).

As the foregoing discussion of the K-O account of the OE phenomenon of high vowel syncope makes clear, however, the phonological rules adopted by K-O are themselves suspect on a number of grounds. Thus, in the K-O system, two independent phonological rules--Strong Marking and Weak Deletion--are introduced to account for a single phonological process--high vowel (and glide) syncope. The first of these rules, Strong Marking, applies left-to-right iteratively through a string, placing a diacritic [+ strong] (equivalent, in effect, to the marking [- deletable]) on certain vowels and glides. The second rule, Weak Deletion, then applies, deleting certain vowels and glides that have not been marked [+ strong]. Both the power (i.e. its iterative nature)[6] and the abstractness (i.e. its having a diacritic rather than a phonetically observable effect) of the rule of Strong Marking speak, on both theoretical and descriptive grounds, against its correctness for the phonology of OE. As regards the rule of Weak Deletion, its considerable formal complexity suggests that perhaps a more general (or at least less complex) characterization of the facts of high vowel syncope in OE can be found. It is with this issue that the remainder of the present work is concerned.

1.3 The Traditional Analysis Reconsidered

As was discussed above, the system of OE phonological rules proposed by K-O contrasts with what they call a "traditional analysis" of high vowel syncope in OE, and which they formulate as in (2) above. Recall that this analysis is rejected by K-O on essentially three grounds: (1) It fails to correctly account for forms such as aedelu, deriving instead the form *aedel from underlying /aedel + y + u/; (2) It relies on the use of the complex conditioning environment appearing in (12):

12. $\left\{ \begin{matrix} \bar{V}C \\ VCC \\ \breve{V}C\breve{V}C \end{matrix} \right\}$

in the formulation of the rules needed to account for the syncope phenomena in OE; and (3) It requires that this unnatural environment appear in two consecutive rules in the grammar, rules, moreover, which have identical inputs. In light, however, of the considerable complexity, the high degree of abstractness, and the formal power embodied in the K-O proposal concerning OE phonology, it would appear to be worthwhile to examine in somewhat more detail the traditional view of the OE phenomena of high vowel syncope to see if, in fact, such shortcomings as those noted by K-O are necessary aspects of the traditional approach.

Consider first K-O's claim that in a traditional account of OE high vowel syncope the environment in (12) must appear in two consecutive rules. For such to be the case, it must be shown that both rules are actually needed in the grammar. Consideration of the operation of the rules appearing in (2), however, reveals that, in fact, rule (2b) in every case obliterates the effects of rule (2a) and that, were rule (2a) non-existent,

no difference in the output of the grammar would be observed. That is, rule (2a) turns glides (which, of course, are always [- stress] into high vowels in exactly that environment in which both glides and unstressed high vowels are deleted by rule (2b). Consequently, there is no reason to include a rule such as (2a) in a description of OE phonology. Thus, the objection to the traditional analysis on the grounds that it requires identical complex conditioning environments in two consecutive rules cannot be substantiated.

A second objection given by K-O to the traditional approach to OE high vowel syncope concerns the complexity of the required conditioning environment itself. This environment (formulated in (12)), they note, "corresponds to no single formula" (p. 532). So stated, of course, it does not. However, if one goes beyond the deletion/retention environments noted by K-O and takes into consideration the entire range of such environments, the "unnaturalness" of the environment appearing in (12) is considerably diminished. Thus, note first that with the formula VCC appearing in (12) K-O subsume both VCC, as in (13):

13. /wend + i + u/
Ø (2b)
wendu

and VCC, as in (14):

14. /wēst + y + es
Ø (2b)
wēstes ('waste': g.s.)

Second, in addition to the deletion environments specifically listed in (12), OE high vowel syncope also occurs in the environment VCCC,[7] as is illustrated in (15):

15. /forxt + u/
Ø (2b)
forht ('fearful': n.s.f.)

Finally, OE high vowel syncope does not take place in the environment $\overline{V}$, as the derivation in (16) illustrates:

16. /cē + i + an/
--- (2b)
y Glide Formation
cēġan ('to call')

Thus, a more complete list of deletion versus retention environments for the OE process of high vowel syncope is that given in (17):

17. a. Deletion environments:

1. $\bar{\breve{V}}C$
2. $\breve{V}CC$
3. $\bar{V}CC$
4. $\breve{V}C\breve{V}C$
5. $\breve{V}CCC$

b. Retention environments:

1. $\bar{\breve{V}}$
2. $\breve{V}C$
3. $\bar{V}C\breve{V}C$

If one assumes now that at the morphophonemic level long vowels are analyzed as vowel sequences, then the unitary nature of the environment in which the OE process of high vowel syncope operates begins to emerge. That is, assuming $\bar{V}$ = VV, then the lists appearing in (17) take on the respective forms in (18):

18. a. Deletion environments:

1. VVC
2. VCC
3. VVCC
4. VCVC
5. VCCC

b. Retention environments:

1. VV
2. VC
3. VVCVC

Noting that in OE, just as in Proto-Germanic, lexical stress occurs on the first vowel in a lexical root (i.e. in the case of (18), the first vowel appearing in each formula), then the deletion environment for the OE process of high vowel syncope can be summarized as (19):

19. Deletion environment:

$$[+\ \text{stress}][+\ \text{segment}]_1^2\ C\ \_\_\_$$

That is, deletion occurs post-consonantally, in a site either three or four segments to the right of the lexically-stressed vowel. The environment defined in (19) includes all of those environments in which it has been shown that high vowel syncope occurs (e.g. in forms such as /word + u/, /werod + u/, /forxt + u/, etc.), while at the same time it excludes the environments listed in (18b), in which, as we have seen, this process does not operate (e.g. in forms such as /hof + u/, /cē + u/, /hēafud + u/, etc.). Such an

environmental specification as that appearing in (19) is by no means so complex as to be excluded a priori from a phonological rule, as K-O originally suggest, and thus a second objection by K-O to an account of the phenomenon of OE high vowel syncope along traditional lines can be rejected.

That leaves, then, the final criticism which K-O make concerning the traditional analysis as formulated in (2) above--that such rules lead to the syncopation of two segments in certain forms in which only one segment should undergo this process. The example K-O give is the derivation of the form aedelu, which they derive from /aedel + y + u/ as in (20):

20. /aedel + y + u/
    * * (3a)
    Ø (11)
    aedelu

In comparison, with the rules appearing in (2), such an underlying form undergoes, according to K-O, a derivation as in (21):

21. /aedel + y + u/
    i (2a)
    Ø Ø (2b)
    *aedel

That is, "since both i and u are after two light syllables at the point when (11) (=(2b)--R.S.) applies", both delete.

In connection with (21), however, note that in their claim concerning the deletion of u in such a derivation K-O are factually incorrect. That is, K-O assert that in (21) both i (from /y/, by (2a)) and u satisfy the deletion environment specified in (2b), repeated in (22):

22. $\left\{ \begin{matrix} \bar{V}C \\ VCC \\ \breve{V}C\breve{V}C \end{matrix} \right\}$

As (22) makes clear, however, only i (from /y/) is in an environment (specifically, VCVC) in which deletion occurs. At the point in the derivation in (21) in which (2b) applies, u appears after a vowel (i.e. the vowel i), and, as (22) indicates, OE high vowel syncope never occurs in a post-vocalic position. Thus, even in terms of the K-O formulation of the traditional analysis of high vowel syncope in OE, the correct derivation of aedelu from K-O's underlying /aedel + y + u/ obtains, as in (23):

23. /aedel + y + u/
    i (2a)
    Ø (2b)
    aedelu

Note, however, that in the above discussion two modifications of the K-O formulation of the traditional account of OE high vowel syncope have been proposed. First, it has been suggested that since a rule syllabifying glides such as that given by K-O as (2a) is superfluous to the phonology of OE, it should be eliminated from the description. Second, rather than utilize the unwieldy formulation of the OE high vowel deletion environment proposed for the traditional analysis by K-O, (22), the suggestion has been made to substitute the formally less complex environment defined in (19). It should be noted, then, that neither of these changes in the description of OE high vowel syncope alters the derivation of a form such as aedelu. That is, in a string such as /aedel + y + u/, it is still the /y/, and only the /y/, which deletes, because it is only this segment which satisfies the deletion environment as defined in (19). The form aedelu, then, is derived in terms of the present formulation of the traditional approach to the OE phenomenon of high vowel syncope as in (24):

24. /aedel + y + u/
Ø ([+stress][+segment][+segment] C___)
aedelu

As (24) indicates, the final objection given by K-O to the traditional analysis of the process of high vowel syncope in OE is eliminated. In short, none of the justifications given by K-O for rejecting an account of the deletion phenomena affecting high vowels in OE along traditional lines can be substantiated, and there appears, therefore, no need to accept an account of such phenomena possessing the highly abstract and inherently powerful nature of the system of rules proposed by K-O.

2. The Deletion of High Vowels in Old English

Even if there is no motivation for employing a system of phonological rules such as those proposed by K-O to account for the deletion of high vowels in OE, there still remains the task of supplying a detailed account of such deletion phenomena in terms of the traditional analysis discussed above. As the system of rules developed by K-O makes clear, the array of facts characterizing the deletion of high vowels in OE is rather complex. This can be seen by surveying the distribution of such deletions in the language. In OE, high vowels are observed to delete in five distinct environments:

(i) After an unstressed /i/, as in (25):[8]

25. /frem + i + ist/
Ø High Vowel Deletion
e Vowel Lowering
fremest ('you perform')

(ii) Pre-vocalically, as in (26):

26. /wend + i + an/
Ø High Vowel Deletion
wendan

(iii) Word-finally, as in (27):

27. /wend + i + Ø/
Ø High Vowel Deletion
wend

(iv) Before either a $C\left[\begin{smallmatrix} V \\ -high \end{smallmatrix}\right]$ or a CVC sequence, as in (28):

28. /hālig + e/ /hālig + um/
Ø Ø HVD
hālge hālgum
('holy': n.p.m.) ('holy':d.p.m.)

(v) After a stressed vowel, as in (29):

29. /cē + i + d/
Ø High Vowel Deletion
cēd ('to call': past part.)

Each of these five environments, however, is associated with its own set of restrictions, determining in which forms the environment actually triggers the deletion of a high vowel. To account, then, for the entire range of facts characterizing high vowel deletion in OE, each of the environments stated above must be examined in turn to determine the exact nature of such deletions.

2.1 /i/-Absorption

K-O motivate a rule of /i/-Absorption in their analysis on the basis of such forms as /frem + i + ist/ and /frem + i + iθ/ ('he performs'), which undergo derivations as in (30):[9]

30. a. /frem + i + ist/ b. /frem + i + iθ/
Ø Ø /i/-Absorption
e e Vowel Lowering
fremest fremeþ

Unlike the high vowel deletion pheneomena treated in Section (1) as aspects of OE high vowel syncope, however, the phenomenon of /i/-Absorption operates regardless of the environment preceding the deletion site. That is, in discussing high vowel syncope above it was noted that one of the main characteristics of this process is that it operates only in the presence of a specific preceding environment, which was summarized above as (19). High vowel syncope applies, for example, in /wend + i + u/, but not in /frem + i + u/, as the derivations in (31) illustrate:

31. a. /wend + i + u/ b. /frem + i + u/
Ø --- High Vowel Syncope
--- y Glide Formation
--- m Gemination
wendu fremmu ('I perform')

/i/-Absorption, on the other hand, requires no particular preceding environment, as the derivations in (32) show:

32. a. /wend + i + ist/ b. /frem + i + ist/

	Ø		Ø	/i/-Absorption
	e		e	Vowel Lowering
	wendest		fremest	

K-O formulate the process of /i/-Absorption as in (33):

33. /i/-Absorption:

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{back} \\ -\text{stress} \end{bmatrix} \longrightarrow \emptyset \; / \; \begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{back} \\ -\text{stress} \end{bmatrix} + \_\_\_\_$$

For purposes of exposition, the formulation of /i/-Absorption appearing in (33) is tentatively adopted in the present analysis (but see the discussion of this phenomenon in the Appendix).

2.2 Glide Formation and Vowel Deletion

The second environment noted above (and illustrated in (26)) in which high vowels delete in OE is pre-vocalically. In OE there is a complementarity of behavior as concerns high vowels in prevocalic position. Such segments either undergo glide formation, as in (34):

34. /her + i + an/

y	Glide Formation
hergan ('to praise')	

or they delete, as in (35):

35. /wend + i + an/

Ø	High Vowel Deletion
wendan	

In considering these two phonological processes, note that it is glide formation, rather than vowel deletion, which is observed in forms containing a long stem-vowel but no stem-final consonant, a fact illustrated in (36) (in which, in accordance with the decision reached in section (1), $\overline{V}$ has been set equal to VV):

36. /cee + i + an/

y	Glide Formation
cēgan ('to call')	

Such a derivation as that in (36), then, supports the view that at the morphophonemic level in OE long vowels are treated as vowel sequences, for given such treatment the distribution of the processes of glide forma-

tion and vowel deletion can be succinctly captured, as in (37):

37. Before a vowel, unstressed high vowels:

    a. become glides, if immediately preceded by the sequence: [+stress][+segment]

    b. delete, otherwise.

Such behavior of OE high vowels in pre-vocalic position can be accounted for by means of the two ordered phonological rules formulated in (38):

38. a. Glide Formation:

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix} \longrightarrow [-\text{syll}] \;/\; [+\text{stress}][+\text{segment}] \_\_\_ [+\text{syll}]$$

    b. Vowel Deletion

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{stress} \end{bmatrix} \longrightarrow \emptyset \;/\; \_\_\_ [+\text{syll}]$$

Derivations illustrating the operation of (38) appear in (39):

39. a. /ner + i + an/
y
---
nergan ('to save')

b. /send + i + an/

Ø
sendan ('to send')

(38a)
(38b)

c. /fee + i + an/
y
---
fēgan ('to join')

d. /ceel + i + an/

Ø
cēlan ('to cool')

(38a)
(38b)

2.3 Terminal Syncope

As the discussion in Section (1) concerning the phenomenon of OE high vowel syncope indicates, the deletion in OE of high vowels in word-final position is one of the most pervasive processes to be observed in the language. Terminal syncope of high vowels in OE is evidenced in all three major lexical categories --- nouns, verbs, and adjectives. The deletion patterns of high vowels in word-final position in OE, however, do not, at first glance at least, appear to be identical in all three categories. Note, for example, that in all of the verbs which exhibit high vowel syncope, such syncope occurs, among other places, in word-final position, as illustrated in (40):

40. a. /send + i + Ø/
Ø
send ('send')

b. /ceel + i + Ø/
Ø
cēl ('cool')

Terminal Syncope

In the nouns and adjectives, on the other hand, two distinct deletion patterns emerge. In those forms in which the segment satisfying the OE high vowel deletion environment (as established in Section (1), and formulated in (19)) is an inflectional ending, and this segment occurs word-finally, it invariably deletes, as, for example, in the forms in (41):

41. a. OE Nouns:

/word + u/	/wiif + u/	
Ø	Ø	Terminal Syncope
word ('word':n.p.)	wīf ('wife':n.p.)	

b. OE Adjectives:

/blind + u/	/wiis + u/	
Ø	Ø	Terminal Syncope
blind ('blind': n.s.f.)	wīs ('wise': n.s.f.)	

However, when a segment which is inherently associated with a particular stem appears word-finally in such a high vowel deletion environment, it fails to delete, as the derivations in (42)(using K-O morphophonemic forms, but noting that $\bar{V}$ = VV) illustrate:

42. a. OE Nouns:

/end + y + Ø/	/wiit + y + Ø/	
---	---	Term. Sync.
e	e	Syll/Lowering
ende ('end': n.s.)	wīte ('punishment': n.s.)	

b. OE Adjectives:

/wild + y + Ø/	/ceen + y + Ø/	
---	---	Term. Sync.
e	e	Syll./Lowering
wilde ('wild': n.s.m.)	cēne ('bold': n.s.m.)	

As was noted in Section (1), K-O account for such differential patternings of the OE process of Terminal Syncope by positing underlying [-syll] values for those segments which fail to delete word-finally (e.g. the /y/'s in (42)), versus underlying [+syll] values for those segments which are observed to delete in this position (e.g. the /u/'s in (41)). These distinctive deletion patterns are formally incorporated into K-O's description of OE phonology using the condition on Weak Deletion discussed in (5a) (i.e.: $_{a}\langle$+syll$\rangle$ . . . $_{b}\langle\#\rangle$: If b, then a).

Such posited morphophonemic distinctions, however, fail to account for the symmetrical distributional facts concerning the two patterns of word-final high vowel deletion mentioned above. That is, in each of the

forms in (42) the segment which appears word-finally is in fact an inherent aspect of the lexical stem in which it occurs. Wīte and ende are members of the class of neuter ja-stem nouns, a (crucially non-morphologically distinct) sub-class of the a-stem nouns.[10] Likewise, cēne and wilde are ja-stem adjectives, a (once again, non-morphologically distinct) sub-class of the a-stem adjectives. In none of the forms in (42), then, is there any motivation for placing a morpheme boundary between the word-final segment (taken in each case as /y/ by K-O) and the preceding segments. Therefore, in place of the underlying forms appearing in (42), we should more appropriately be dealing with the respective forms in (43):

43. a. OE Nouns:

/endy + Ø/ /wiity + Ø/

b. OE Adjectives

/wildy + Ø/ /ceeny + Ø/

Note, now, that on the basis of the forms appearing in (43), as compared to those in both (40) and (41),[11] the distinction maintained by K-O between underlying /i/ (which deletes word-finally) and underlying /y/ (which does not delete in this position) is not necessary. It is, rather, as these forms indicate, the appearance of a morpheme boundary before a segment occurring in an OE high vowel deletion environment which determines whether or not this segment deletes word-finally. Specifically, a high vowel appearing in such a deletion site deletes word-finally if and only if it is immediately preceded by a morpheme boundary. Such considerations, then, considerably weaken K-O's motivation for maintaining a word-final underlying distinction between /i/ and /y/, since this distinction is no longer needed to account for the pattern of OE high vowel deletion in word-final position.

There is, however, another function assigned by K-O to the word-final distinction between /i/ and /y/ which they maintain in their account of OE phonology. This concerns the operation of the OE process of gemination. In the K-O system, it is /y/, but not /i/, which triggers gemination. In word final position, where the distinction between /i/ and /y/ in the K-O system is crucial for determining the pattern of gemination observed in OE,[12] derivations such as those in (44) are found (using K-O morphophonemic forms):

44. a. /kun + y + Ø/ b. /fraem + i + Ø/

ü		e	Umlaut
*		*	Strong Marking
---		---	Weak Deletion
n		---	Gemination
---		e	Lowering
cynn ('race': n.s.)		freme ('perform')	

Cynn is, in fact, typical of the forms which, in the K-O system, undergo

word-final gemination on the basis of an underlying final /y/. To see how this underlying /y/ is reflected in the other paradigmatic forms of this noun, the entire inflectional paradigm of cynn is presented in (45):

45.

	Singular	Plural
Nom.	cynn[12]	cynn
Acc.	cynn	cynn
Gen.	cynnes	cynna
Dat.	cynne	cynnum

As the forms in (45) illustrate, the K-O posited morphophonemic /y/'s in the paradigm of the noun cynn (i.e. /kun + y + ending/) appear phonetically in each inflectional form as geminate copies of the preceding consonant. In terms of generally accepted constraints on phonological abstractness, such patterning indicates that it is not an absolute neutralization of an underlying /y/ being observed in the paradigm of cynn, but rather that such paradigms contain underlying geminate lexical stems. There are, in short, no alternations in OE to support the K-O view that morphophonemic /y/ causes gemination word-finally. Consequently, the facts of OE gemination provide no support for the K-O claim that an /i/-/y/ distinction obtains word-finally in OE. Thus, since neither high vowel deletion nor gemination, the two phenomena taken by K-O to substantiate a word-final distinction in OE between /i/ and /y/, provide any evidence in favor of such a distinction, there are no grounds for maintaining it. Eliminating, then, all K-O posited word-final /y/'s in favor of /i/'s, those instances of OE high vowel syncope which occur in word-final position can now be accounted for in the present analysis, using the deletion environment motivated in Section (1) and formulated in (19), as in (46):

46. Terminal Syncope:

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix} \rightarrow \emptyset \;/\; [+\text{stress}][+\text{segment}]_1^2 \; C + \_\_\_ \; \#$$

Derivations illustrating the operation of (46) appear in (47):

47. a. /frem + i + Ø/
---
e
freme

b. /send + i + Ø/
Ø — Term. Sync.
--- — Lowering
send

c. /sċip + u/
---
sċipu ('ship':n.p.)

d. /word + u/
Ø — Term. Sync.
word

e. /til + u/
---
tilu ('good':n.s.f.)

f. /wīis + u/
Ø — Term. Sync.
wīs

2.4 Internal Syncope

The fourth deletion phenomenon affecting OE high vowels noted at the outset of Section (2) (and illustrated in (28)) is the deletion of high vowels in "open" medial syllables. As discussed in Section (1.2), such internal syncopation of high vowels appearing in an OE high vowel deletion environment is triggered by either of two sequences following the deletion site:

(1) The sequence C $\begin{bmatrix} V \\ -high \end{bmatrix}$, as in hēafde ('head': d.s.)(from /hēafud + e/):

or, (2) The sequence CVC, as in hēafdum ('head': d.p.) (from /hēafud + um/).

On the basis of such considerations, then, the process of OE Internal Syncope can be schematically formulated as in (48):

48. Internal Syncope (schematic formulation):

$$/i/, /u/ \rightarrow \emptyset \; / \; \text{(deletion environment)} \_\_ \; C \left\{ \begin{matrix} VC \\ \begin{bmatrix} V \\ -high \end{bmatrix} \end{matrix} \right\}$$

Using the angled bracket notation, the two environments appearing within the braces in (49) can be combined, resulting in the revised schematic formulation of Internal Syncope appearing in (49):

49. Internal Syncope (schematic formulation revised):

$$/i/, /u/ \rightarrow \emptyset \; / \; \text{(deletion environment)} \_\_ \; C \left[{}_{a} \left\langle \begin{matrix} V \\ +high \end{matrix} \right\rangle \right] {}_{b} \langle C \rangle$$

Condition: if a, then b.

In comparing the processes of Terminal and Internal Syncope, note that the "deletion environment" required for the process of Internal Syncope is distinct from that required for Terminal Syncope (46) in two respects. First, no morpheme boundary is needed in the formulation of Internal Syncope, as the derivation in (50) illustrates:

50. /aagin + es/
    Ø Internal Syncope
    āgnes ('own': g.s.)

Second, no distinction corresponding to that found with Terminal Syncope between forms such as those in (51) is observed:

51. a. /werod + u/ b. /haaliġ + u/
    Ø ---
    werod hāliġu Terminal Syncope

That is, while a string of the form $\overline{V}CVC$ must be specifically excluded from the deletion environment conditioning Terminal Syncope (as illustrated in (51b)), no forms exist in OE which indicate that such a re-

striction is needed for the OE process of Internal Syncope. Crucial forms do not occur. Thus, the "deletion environment" mentioned in (48) and (49) can be given in its most general form as in (52):

52. Internal Syncope Deletion Environment:

$$[+\text{stress}][+\text{segment}]_1 \ C \ \_\_$$

Utilizing (52), the complete formulation of the OE process of Internal Syncope appears as in (53):

53. Internal Syncope:

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix} \rightarrow \emptyset \ / \ [+\text{stress}][+\text{segment}]_1 \ C \ \_\_ \ C \left[{}_{a}\langle +\text{high} \rangle \right] \ {}_{b}\langle C \rangle$$

Condition: If a, then b.

The operation of (53) is illustrated in the derivations in (54):

54. a. /drüxtin + es/ → dryhtnes ('lord': g.s.)

b. /feed + i + de/ → fēdde ('I fed')

2.5 Vowel Elision

The final OE process which deletes high vowels is that of Vowel Elision. This process, unlike the previous four OE deletion phenomena considered, is not restricted to the deletion of only high vowels. Rather, Vowel Elision in OE elides any vowel occurring in a certain phonological environment. K-O motivate a rule of Vowel Elision in their account of OE phonology on the basis of forms such as those derived in (55) (p. 536):

55. a. /sc̈ox + as/ → scōs ('shoe': n.p.)

b. /fe x + u/ → feo ('cattle': n.p.)

Breaking
/x/-Deletion
Vowel Elision

Given the fact that the rule of Breaking must operate to insert a [ə] between the stressed vowel causing Vowel Elision and the vowel being elided, K-O formulate a rule of Vowel Elision to allow for the "elision of unstressed vowels immediately following stressed vowels and diphthongs" (p. 536), as in (56):

56. Vowel Elision (K-O Formulation):

$$V \longrightarrow \emptyset \; / \; \begin{bmatrix} +\text{syll} \\ +\text{stress} \end{bmatrix} \; (V) + \_\_\_\_$$

In the present account of the OE phonological system, in which $\overline{V}$ = VV, such a formulation of Vowel Elision as that given by K-O produces the correct derivations, since the optional "V" appearing in (56) allows for the deletion of a suffix or a "stem-extension" vowel after a long vowel, as in (57):

57. a. /sc̄oox + as/ b. /cee + i + d/

	Ø		---	/x/-Deletion
	Ø		Ø	Vowel Elision
sc̄os		cēd		

In line with the formulations given above for the other rules of OE phonology considered, the rule of Vowel Elision appears in the present system as (58):

58. Vowel Elision:

$$[+\text{syll}] \longrightarrow \emptyset \; / \; [+\text{stress}] \; ([+\text{syll}]) + \_\_\_\_$$

On the basis of the rules of /i/-Absorption (33), Glide Formation (38a), Vowel Deletion (38b), Terminal Syncope (46), Internal Syncope (53) and Vowel Elision (58), all instances of high vowel deletion in OE are accounted for.

2.6 Ordering the Phonological Rules

The five phonological rules discussed and formulated in Sections (2.1) through (2.5) are, in a number of instances, crucially related to one another by extrinsic ordering relationships. Thus, /i/-Absorption (33) must precede Glide Formation (38a), as illustrated in (59):

59. a. /frem + i + ist/ b. /frem + i + ist/

	Ø	(33)		y	(38a)
---		(38a)	---		(33)
---		Gem.		m	Gem.
e		Low.	---	e	Low.
fremest			*fremmest		

Terminal Syncope (46) must precede Vowel Deletion (38b), as the derivations in (60) show:

60. a. /wiiti + u/ b. /wiiti + u/

---		(46)	Ø	(38b)
Ø		(38b)	Ø	(46)
wīt̄u			*wīt̄	

Glide Formation (38a) must, however, precede Vowel Elision (58):

61. a. /cee + i +an/
y (38a)
--- (58)
cēġan

b. /cee + i + an/
Ø (58)
--- (38a)
*cēan

Such considerations result, then, in the partially ordered set of phonological rules summarized in (62):

62. a. /i/-Absorption

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{back} \\ -\text{stress} \end{bmatrix} \rightarrow \emptyset \; / \; \begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{back} \\ -\text{stress} \end{bmatrix} + \_\_\_$$

b. Terminal Syncope:

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix} \longrightarrow \emptyset \; / \; [+\text{stress}][+\text{segment}]_1^2 \; C + \_\_\_ \; \#$$

c. Internal Syncope:

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix} \longrightarrow \emptyset \; / \; [\text{stress}][+\text{segment}]_1 \; C \_\_ C \begin{bmatrix} +\text{syll} \\ {}_a\langle +\text{high} \rangle \end{bmatrix} {}_b\langle C \rangle$$

Condition: If a, then b.

d. Glide Formation

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix} \longrightarrow [-\text{syll}] \; / \; [+\text{stress}][+\text{segment}] \_\_\_$$

e. Vowel Deletion:

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{stress} \end{bmatrix} \rightarrow \emptyset \; / \; \_\_\_ \; [+\text{syll}]$$

f. Vowel Elision:

$$[+\text{syll}] \longrightarrow \emptyset \; / \; [+\text{stress}]([+\text{syll}]) + \_\_\_\_$$

2.7 Combining the Phonological Rules

As the K-O treatment of the deletion of high vowels (and, in their system, glides) in OE indicates, a number of processes formulated in (62) can, through the use of certain formal devices which have been proposed for inclusion in phonological theory, be combined into a single rule. Specifically, Terminal Syncope, Internal Syncope, and Vowel Deletion, all

of which share some characteristics of the OE high vowel deletion environment formulated as (19) in Section (1), are amenable to formulation as a single rule. The appropriate formulation for such a rule is that in (63):

63. OE High Vowel Syncope:

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix} \rightarrow \emptyset \;/\; [+\text{stress}][+\text{segment}]_1^2\ C\ \ a\langle + \rangle \_\_ \left\{ b\langle \# \rangle \begin{bmatrix} +\text{syll} \\ d\langle -\text{high} \rangle \end{bmatrix} e\langle C \rangle \right\}$$

$$c\langle C \rangle$$

Conditions: If b, then a.
If c, then d or e.

3. Conclusion

The rule of OE High Vowel Syncope appearing in (63) corresponds in the present analysis of OE phonology to the rules of Strong Marking and Weak Deletion (repeated in (64)) proposed by K-O to account for the same range of facts:

64. The K-O Account of OE High Vowel Syncope:

a. Strong Marking (left-to-right iterative):

$$[-\text{cons}] \rightarrow [+\text{strong}] \;/\; \begin{bmatrix} -\text{cons} \\ -\text{long} \\ -\text{strong} \end{bmatrix} \left\{ \begin{matrix} [-\text{syll}] \\ + \end{matrix} \right\} \_\_$$

b. Weak Deletion:

$$\begin{bmatrix} -\text{stress} \\ -\text{cons} \\ +\text{high} \\ -\text{strong} \\ a\langle +\text{syll} \rangle \end{bmatrix} \rightarrow \emptyset \;/\; C \_\_ \left\{ \begin{matrix} b\langle C \rangle \\ e\langle \# \rangle \end{matrix} \begin{bmatrix} V \\ c\langle -\text{high} \rangle \end{bmatrix} d\langle C \rangle \right\}$$

Conditions: If e, then a.
If b, then c or d.

What (63) and (64b) show is that, using conditions on angled brackets in phonological rules, processes which are similar but which maintain certain distinctions in their conditioning environments can often be formulated as aspects of a single phonological process. Whether such rule combination is a mode of description to be preferred over that using separate formulations of distinct processes, such as those found in (62), is an empirical question, the answer to which lies in the nature of phonological systems. Regardless of how this question is resolved, however, the above account of the facts of high vowel syncope in OE shows clearly

that an adequate phonological description of OE along the lines of what K-O have called a "traditional analysis" is attainable, and is, in many respects, to be preferred to that account using iterative rules (Strong Marking), diacritic features [± strong]), unmotivated morphophonemic distinctions (that between /i/ and /y/ in word-final position), and formally complex phonological rules (Weak Deletion) proposed by K-O.

Appendix: The Phonology of Old English Weak Verbs

Old English, as a member of the Germanic family of languages, contains two morphologically distinct verb types, the so-called "strong" and "weak" verbs. These two Germanic verb types are characterized by two fundamental distinctions, one inflectional and one structural. Inflectionally, the Germanic (and OE) strong verbs employ a series of stem-vowel alternations (so-called "Ablaut") to encode tense (and, in some cases, number) distinctions. Correspondingly, the weak verbs utilize a set of inflectional endings (specifically, a so-called "dental preterite") to indicate these same distinctions.

The phonologically more significant distinction between the Germanic (and OE) strong and weak verbs is, however, the structural one. The strong verbs are characterized by a lexical structure in which the inflectional endings are attached directly to each verbal stem. That is, schematically, strong verbs have the structure appearing in (A1):

A1. Strong verb structure: /stem + ending/

The weak verbs, correspondingly, contain an extra structural unit in their prototypical forms. That is, in the case of the Germanic weak verbs, a "stem-extension" marker appears between each verbal stem and the inflectional ending with which it appears. Thus, schematically, Germanic (and OE) weak verbs have the structure in (A2):

A2. Weak verb structure: /stem + stem-extension + ending/

In Proto-Germanic there were four distinct classes which comprised the weak verbs.[14] All four of these Germanic weak classes did not, however, survive into OE. First, by the time of OE, all of the members of the Germanic fourth weak verb class had moved into other (mostly into the second) weak verb classes. In addition, of the original members of the Germanic class III weak verbs, only four retained paradigms distinct from both the first and the second weak verb classes. These four verbs--hycgan ('to think'), secgan ('to say'), habban ('to have'), and libban ('to live')--exhibit, moreover, considerable irregularity in their attested forms in the OE manuscripts. Such OE data concerning these four verbs, in conjunction with the fact that only four such verbs are to be found in the language, indicate that, by the time of OE, the third class of Germanic weak verbs had been "de-activated" as a distinct verb class in the language. It had, that is, become a small group of verbs (consisting of but four members) marked as lexically irregular.[15] That

left in OE, then, just two "active" classes of weak verbs, the traditional class I and class II weak verbs.

A.1 The Old English Class I Weak Verbs

The OE class I weak verbs have received extensive consideration in the main body of the present work. As the discussion there concerning such verbs indicates, the stem-extension marker characterizing the OE class I weak verbs is /i/. This /i/, on the basis of the fact that it is morphologically distinct from the verbal stems with which it appears, patterns with respect to the OE phenomenon of high vowel syncope the same as an inflectional ending (see, for example, (40) above). Each of the possible surface realizations of this class I weak verb stem-extension marker has been accounted for in Section (2) above, as illustrated in (A3):

A3. a. [y]: /her + i + u/
y — Glide Formation
hergu

b. [e]: /her + i + Ø/
e — Lowering
here

c. [C]: /frem + i + u/
y — Glide Formation
m — Gemination
fremmu

d. Ø: i. /wend + i + u/
Ø — Vowel Deletion
wendu

ii. /wend + i + Ø/
Ø — Terminal Syncope
wend

iii. /ceel + i + de/
Ø — Internal Syncope
cēlde

iv. /cee + i + d/
Ø — Vowel Elision
cēd

A.2 The Old English Class II Weak Verbs

The phonological behavior of the OE class II weak verbs is of particular interest on account of the fact that such verbs superficially

violate a number of well-supported phonological processes in the language. Thus, typically in OE the occurrence of either an i or a y in a string triggers, where possible, both the processes of Umlaut and Palatalization. For example, in the OE class I weak verbs, in which a stem-extension /i/ appears in each underlying form, each stem exhibits, where possible, the effects of these phonological processes. In the second class of weak verbs in OE, however, in spite of the fact that at the surface these verbs exhibit in a number of forms an [i] directly after the lexical stem, neither Umlaut nor Palatalization ever occurs. The failure of these processes to apply can be seen, for example, in the paradigms of such class II weak verbs as lufian ('to love') and lōcian ('to look'):

A4. Class II weak verb paradigmatic forms (orthographic):

Infinitive:			lufian	lōcian
Present:	Singular	1.	lufiu	lōciu
		2.	lufast	lōcast
		3.	lufaþ	lōcaþ
	Plural	1-3.	lufiaþ	lōciaþ
Imperative	Sing.	2.	lufa	lōca
Past:	Singular	1/3.	lufade	lōcade

As the forms lufian, lufiu, lufiaþ, lōcian, lōciu, and lōciaþ indicate, the appearance of an [i] after the stem in an OE class II weak verb form fails to cause either Umlaut or Palatalization.

To account for such class II weak verb forms as those appearing in (A4), K-O take the following two steps. First, they adopt as the phonetic correlates of the forms in (A4) containing an i, the values in (A5):

A5. a. lufian = [luviyan]
b. lufiu = [luviyu]
c. lufiaþ = [luviyaθ]

d. lōcian = [lōciyan]
e. lōciu = [lōciyu]
f. lōciaþ = [lōciyaθ]

They then adopt underlying forms for the OE class II weak verbs as in (A6):

A6. a. /luva + i + an/ ⟶ [luviyan]
b. /luva + i + u/ ⟶ [luviyu]
c. /luva + i + ist/ ⟶ [luvast]
d. /luva + i + iþ/ ⟶ [luvaθ]
e. /luva + i + aþ/ ⟶ [luviyaθ]
f. /luva + i + Ø/ ⟶ [luva]
g. /luva + i + de/ ⟶ [luvade]

As the forms in (A6) indicate, in the K-O account of OE class II weak verbs, the stem-extension is taken to be identical to that which characterizes the OE class I weak verbs, /i/, and each OE class II weak verb stem is taken to end in the vowel /a/.

To account for the derivations illustrated in (A6), K-O note the effects on such underlying forms of a number of independently needed OE phonological rules. Thus, they point out that if Umlaut is allowed to apply to unstressed as well as stressed vowels, then a change from /a/ to /e/ in each of the forms in (A6) is obtained. In addition, allowing the process of glide formation to affect the /i/'s in the forms in (A6) in which such /i/'s are followed by a vowel, results in, for (A6a), (A6b), and (A6e), respective derivations such as those in (A7):

A7. a. /luva + i + an/ b. /luva + i + u/ c. /luva + i + aθ/

	e		e		e	Umlaut
	y		y		y	Gl.Form.

If, then, we "add a rule raising unstressed e to i before [-back, +high] segments" (p. 540), the K-O posited surface forms for the strings in (A7) are obtained.

To account for the other class II weak verb forms appearing in (A6), in which the posited stem-extension /i/ deletes in each case, K-O must rely on a deletion process restricted to just the class II weak verbs, for, as was seen in considering the OE class I weak verbs, the identical stem-extension /i/ there does not delete in the corresponding inflectional forms. In fact, as K-O note, their posited morphophonemic /i/'s in the forms of the class II weak verbs are "retained before a vowel, otherwise deleted" (p. 541). But, as they also note, "this is a fact about verbs of the second weak class only, so any rule that we write will have to be so restricted" (p. 541-42). The required rule is then formulated as (A8) (p. 551):

A8. /i/-Extinction:

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{back} \\ -\text{stress} \end{bmatrix} \longrightarrow \emptyset \; / \; [_{V}\text{Stem}_{II} \_\_\_ + C_o \; [-\text{segment}]$$

A number of aspects of the K-O treatment of OE class II weak verbs described above deserve somewhat deeper scrutiny. To begin with, their interpretation of a form such as orthographic lufian as containing a [y] is never justified. In arriving at a phonetic value for this form, K-O specifically seek to refute K's claim that the i in such a form is to be taken as phonetically identical to the ġ's in class I weak verb forms such as nerġan and class III weak verb forms such as lifġan. To this end, K-O point out that such class II weak verbs are consistently differentiated in the Vespasian Psalter (the OE data base for both K and K-O) from OE class I and class III weak verbs in that a "yod" (ȝ) appears in

the latter two classes, while an i appears in the former class. Thus, whereas K interprets all three weak verb types as trisyllables of the form [stem / i / ending], K-O claim that class I and class III forms such as nergan and lifgan, respectively, are actually bisyllabics of the form [stem - y / ending].

While such reasoning concerning the interpretation for both the class I and class III weak verbs seems well-founded, the fact that K-O go on to interpret class II weak verb forms such as lufiu as phonetically [luviyu] and not as phonetically [luviu] seems puzzling. In fact, in their discussion of the orthographic distinctions holding between the class II weak verbs on the one hand, and both the class I and class III weak verbs on the other, they come to the conclusion that "there can be no doubt that the spelling represents a difference in pronunciation between disyllabic [neryu], [livyu] and trisyllabic [luviu] or [luviyu]" (p. 539). All of the arguments produced by K-O, however, indicate a value of [luviu] for orthographic lufiu, and no explanation is given as to why a possible value [luviyu] is even considered. But it is this latter value that K-O, with no further discussion, adopt.

This choice by K-O appears to be an unfortunate one in a number of respects. First, it leads them to posit underlying forms for the class II weak verbs in which, as noted above, the stem-extension is identical to that found in the class I weak verbs, this in spite of the fact that these two verb classes exhibit radically different phonologies. In the K-O account it is also an idiosyncratic fact about each class II weak verb that its lexical stem ends with the segment /a/. Finally, the class II weak verb morphophonemic forms posited by K-O require a deletion rule (/i/-Extinction) which must be restricted in its application to the second class of weak verbs.

The facts of the phonology of OE class II weak verbs, however, lead to a rather different view of these verbs than that taken by K-O. First, the phonetic correlates of forms such as orthographic lufian, lufiu, and lufiaþ are, by K-O's own reasoning, best taken as [luvian], [luviu], and [luviaþ], respectively. We thus have, for the paradigmatic forms of the verb lufian discussed in (A5) above, phonetic forms such as those given in (A9):

A9. a. lufian = [luvian]
b. lufiu = [luviu]
c. lufast = [luvast]
d. lufaþ = [luvaθ]
e. lufiaþ = [luviaθ]
f. lufa = [luva]
g. lufade = [luvade]

Looking first at forms (A9c), (A9d), (A9f), and (A9g), note the appearance of an [a] in each form, an [a], moreover, which is not introduced as part of an inflectional ending. The occurrence of such [a]'s is evidence for their being there underlyingly, as the stem-extension marker for the

second class of OE weak verbs.[16] If /a/ is posited as the stem-extension, then underlying forms for the members of the paradigm of lufian given in (A9) appear as in (A10):

A10. a. lufian ← /luv + a + an/
b. lufiu ← /luv + a + u/
c. lufast ← /luv + a + ist/
d. lufaþ ← /luv + a + iθ/
e. lufiaþ ← /luv + a + aθ/
f. lufa ← /luv + a + Ø/
g. lufade ← /luv + a + de/

Forms (A10f) and (A10g) come to the surface unchanged. Forms (A10c) and (A10d) can readily be accounted for by generalizing the rule of /i/-Absorption from that posited by K-O, (A11):

A11. /i/-Absorption (K-O version):

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{back} \\ -\text{stress} \end{bmatrix} \rightarrow \emptyset \; / \; \begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{back} \\ -\text{stress} \end{bmatrix} + \_\_$$

to the form appearing in (A12):[17]

A12. /i/-Absorption (revised):

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{back} \\ -\text{stress} \end{bmatrix} \rightarrow \emptyset \; / \; \begin{bmatrix} +\text{syll} \\ -\text{stress} \end{bmatrix} + \_\_ \; C$$

Thus, not only does the process of /i/-Absorption operate in the first class of OE weak verbs, as in (A13):

A13. a. /frem + i + ist/ → fremest (Ø, e)
b. /frem + i + iθ/ → fremeþ (Ø, e)
/i/-Absorption
Lowering

but it operates in the second class of weak verbs as well:

A14. a. /luv + a + ist/ → lufast (Ø)
b. /luv + a + iθ/ → lufaþ (Ø)
/i/-Absorption

Finally, in (A10a), (A10b), and (A10e), the only three forms in which the inflectional ending begins with a non-/i/ vowel, the class II weak verb stem-extension /a/ appears phonetically as [i]. The most direct account of such a distribution is one based on a rule such as (A15):

A15. /a/-Raising:

$$\begin{bmatrix} +\text{syll} \\ +\text{low} \\ -\text{stress} \end{bmatrix} \longrightarrow \begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} \quad / \quad \underline{\quad} + [+\text{syll}]$$

That is, unstressed /a/ becomes [i] before an inflectional vowel. Ordering this rule after the rule of /i/-Absorption insures that an inflectional /i/ does not trigger the process of /a/-Raising, as the facts require (see (A14)). In addition, if /a/-Raising is placed after the processes of Umlaut and Palatalization in the OE rule ordering, then the failure of these two processes to apply in the OE class II weak verb paradigms is automatically accounted for. In fact, (A15), which has the advantage over K-O's rule of /i/-Extinction in that it need not be restricted in its operation to just the OE class II weak verbs, is the only additional phonological rule required to fully account for the observed class II weak verb forms on the basis of a class II weak verb stem-extension /a/.

Footnotes

[1]The digraph ēa in the form hēafudu represents a single long vowel, the phonetic quality of which is a matter of some controversy. This digraph is used here in the morphophonemic form to render this long vowel, since its exact quality is immaterial to the present discussion.

[2]As K-O's further discussion of this phenomenon indicates, it is not really "any" postconsonantal [-strong] segments which deletes, but only those which satisfy certain additional environmental and segmental specifications, as stated in rule (3b).

[3]In illustrating the operation of (3a) and (3b), K-O also cite the form westin(n) (in which the terminal gemination is optional), which they derive as in (i):

(i) /wēstin + y + u/

	*	(3a)
	Ø	(3b)
	n	Gemination

westin(n) ('desert': n.s.)

However, neither this nor any structurally similar form actually occurs in the Vespasian Psalter (VP) (the data-base adopted by K-O for their account of OE phonology), and in fact such forms show considerable variation in the OE dialects with respect to the phenomenon of OE High Vowel Syncope. The variable behavior of certain similar forms in VP is dealt with in Schmierer (1977), but is beyond the scope of the present work.

[4]In the OE manuscripts, cynn and wēstenn (see footnote 3) sometimes appear in the degeminated forms cyn and wēsten, respectively. K-O

account for such variations with an obligatory (pre-consonantally)/ optional (word-finally) rule of degemination, an aspect of their analysis not at issue here.

[5]The "or" in this condition is to be taken in the "inclusive" sense. That is, both b and c may be present, as in the derivation of hēafdes (illustrated in (5b)).

[6]The claim that iterative rule application in the description of the OE phenomenon of high vowel syncope represents an added degree of theoretical "power" is based on the fact that OE high vowel syncope is never observed to affect more than one segment per string. Thus, while it is possibly the case that certain types of phonological phenomena (such as alternating stress, vowel harmony, etc.) are "naturally" viewed as employing iterative rule application, such phenomena are markedly different than the phenomenon of high vowel syncope in OE, since processes such as alternating stress and vowel harmony are observed to affect more than one segment per string. Iterative rule application directly captures this aspect of the operation of such processes. This conception of different "natural" modes of rule application for different types of phonological processes can be incorporated into phonological theory on the basis of principles such as the following:

(i) Processes which are observed to affect more than one segment per string apply iteratively.

(ii) Processes which are observed to affect only one segment per string do not apply iteratively.

Any variation from such mode of rule application, then, is to be counted as additional "cost" in terms of the evaluation of the grammar.

[7]Concerning the environment VCCC with respect to the OE phenomenon of high vowel syncope, the following should be noted. No crucial forms occur in the language containing either the sequence $\overline{V}CCC$, or containing more than three contiguous consonants (such as $\overline{V}CCCC$). Thus, the patterning which OE high vowel deletion would show in such environments cannot be determined. However, it is likely that, since both $\overline{V}CC$ and VCCC represent deletion environments for OE high vowel syncope, the presence of one or more additional consonants in such sequences would not change the observed pattern of deletion. Thus, while such environments are not taken into account in the body of the present study (which deals only with the known deletion/retention environments), such additional environments could be subsumed in the formula appearing in (19) below (in which the OE high vowel deletion environment is given in a unified form) by generalizing the formulation appearing there to allow more than one consonant to immediately precede the deletion site. Such a generalized version of (19) would appear as (i):

(i) Deletion environment:

$$[+\text{stress}][+\text{segment}]_1^2\ C_1\ \_\_\_$$

[8]At this point it is immaterial which /i/ in a sequence of two unstressed /i/'s undergoes deletion. In the Appendix, however, where this phenomenon is taken up once again, it is shown that it must be the second of two such /i/'s which deletes.

[9]Actually, K-O posit the underlying form of the stem-vowel in the verb fremman as /ae/, not as /e/, the form appearing in (30). K-O have this underlying /ae/ undergo Umlaut, and thus appear as /e/ on the surface. However, since the stem-vowel in fremman appears in every inflectional form of this verb as [e], it is being given this value underlyingly in the present analysis.

[10]That is, the OE reflexes of the Proto-Germanic ja-stem nouns are a sub-class of the a-stem nouns in that all such nouns end in the same segment (/y/ in the K-O system, but as will be seen shortly, /i/ in the present account). This group of nouns is thus a "sub-class" in the same sense in which all a-stem nouns ending in, say, the segment /t/ constitute a "sub-class" of the a-stem nouns.

[11]In the forms in (40) and (41) the presence of a morpheme boundary between the segment which deletes and the other segments in the string is well motivated. In (40), the deleting segment is the so-called "stem-extension" marker for the first class of OE weak verbs. As is discussed in the Appendix, each class of weak verbs in the Germanic languages is characterized by a particular stem-extension marker which occurs between each verbal stem and the inflectional ending with which the verbal stem is associated. To account for its distribution, this marker must be set off from the verbal stem as a separate entity. In the case of the forms in (41), the morpheme boundary appearing to the left of the segment which deletes is justified by the fact that in each case this segment is an inflectional ending.

[12]That is, in the K-O system /y/ causes gemination in two positions: word-finally, and pre-vocalically. But the /i/-/y/ distinction is not crucial pre-vocalically, since /i/ becomes /y/ in this position via glide formation before gemination takes place.

[13]In those cases in which the inflectional ending has the form Ø, cynn appears optionally as cyn (see footnote 4).

[14]All four of the Germanic weak verb classes are found in their paradigmatically "active" forms (i.e. structured as in (A2)) in more archaic dialects. Wulfilan Gothic, for example, the oldest well-attested Germanic language, clearly shows these distinctions. In this language, representatives of each of the weak verb classes such as those in (i) are found:

(i) a. Class I: nasjan ('to save')
b. Class II: salbōn ('to anoint')
c. Class III: haban ('to have')
d. Class IV: fullnan('to become full')

The respective underlying forms for the verbs appearing in (i) illustrate the structural nature of the Germanic weak verbs, each exhibiting a stem-extension marker between the verbal stem and the inflectional ending:

(ii) a. /nas + i + an/ [nasjan]
b. /salb + ō + an/ [salbōn]
c. /hab + ɛ̄ + an/ [haban]
d. /full + n + an/ [fullnan]

For the justification of the respective values of the stem-extension markers appearing in (ii), see Schmierer (1977).

[15]Jasanoff (1973), for example, concerning the reflex of the Germanic third weak verb class in OE, notes the following (p. 851):

> The greatest complexity is found in Old Saxon and Old English. In both languages, the 3rd weak class is a mere vestige of a category, the great majority of originally 3rd class verbs having been absorbed into the productive 2nd, or ō class.

[16]This approach to the OE class II weak verbs stems from a suggestion made originally by Alan Prince.

[17]"C" has been placed after the deletion site in (A12) to prevent /i/ from deleting in a form such as:

(i) /cee + i + an/
--- /i/-Absorption
y Glide Formation
cēġan

In /cee + i + an/, in which /ē/ has been taken to equal /ee/ (as throughout the present approach to OE phonology), /i/ follows directly after an unstressed vowel, but does not precede a consonant.

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