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Metathesis and Old English Phonology

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Introduction

The present study is intended to give a rather detailed picture of a certain portion of Old English (OE) phonology. It will not limit itself to a few rules and a small number of facts but rather will attempt to deal with a wide range of data and the network of phonological rules which, it is felt, account for these data. There is a particular reason for this. An account which deals with a small number of facts and a very few rules, though often interesting, is rarely conclusive since the possibility that more data will shed an entirely different light on the isolated set of facts at hand is very strong. However, ceteris paribus, the wider and wider the range of facts that are adequately covered the more confidence one can have in an account precisely because it is less vulnerable to the onslaught of new data. No account is ever free from this, of course, the present account being no exception. Still, it is hoped that sufficient coverage has been achieved to render the account believable.

Vowel Deletion

In Indo-European nouns were divided into two inflection classes, vowel stems and consonant stems. The counterparts of these two classes in OE are called Strong Declensions and Weak Declensions, respectively. The strong declensions are themselves subcategorized in the traditional grammars in terms of the characteristic vocalic element to which the inflections were added. The following paradigm is typical:

(1) Strong Declension[1]

pure a-nouns

	Masculine	Neuter	
Sg.			
Nom.	stān 'stone'	sċip 'ship'	word 'word'
Acc.	stān	sċip	word
Gen.	stānes	sċipes	wordes
Dat.	stāne	sċipe	worde
Pl.			
Nom.	stānas	sċipu	word
Acc.	stānas	sċipu	word
Gen.	stāna	sċipa	worda
Dat.	stānum	sċipum	wordum

Factoring out the stems stān-, sċip- and word- in (1) we set up the following inflectional endings for pure a-nouns:

(2)

	Masculine	Neuter
Sg.		
Nom.	Ø	Ø
Acc.	Ø	Ø
Gen.	es	es
Dat.	e	e
Pl.		
Nom.	as	u[2]
Acc.	as	u
Gen.	a	a
Dat.	um	um

Consider, now, the paradigm for ende 'end', a strong declension ja-noun, so-called because the characteristic a-vowel was preceded by a glide in Germanic (Gmc.):

(3)

	Masculine
Sg.	
	ende
	ende
	endes
	ende
Pl.	
	endas
	endas
	enda
	endum

Assuming the nom./acc. sg. to represent the nominal stem to which the ending Ø has been added, we must suppose that ende is a dis-syllabic stem. However, the addition of the masculine endings of (2) to this stem should yield surface forms of a different sort:

(4) Sg.

ende + Ø ⟶ ende

ende + Ø ⟶ ende

ende + es ⟶ *endees

ende + e ⟶ *endee

Pl.

ende + as ⟶ *endeas

ende + as ⟶ *endeas

ende + a ⟶ *endea

ende + um ⟶ *endeum

Except for the nom./acc. sg. forms, the addition of the endings to ende yields incorrect forms. If, however, we were to suppose that a vowel deletion rule operated in (4) to delete an unstressed vowel before the following vowel initial ending, the correct forms would be achieved:

(5) Vowel Deletion (first approximation)

$$V \longrightarrow \emptyset \quad / \quad \left[\frac{\quad}{-\ \text{stress}}\right] V\ C_o\ \#$$

Allowing this rule to apply to the forms in (4) will give the desired results as the following indicate:

(6)	gen. sg.	ende + es	dat. pl.	ende + um	
		ø		ø	by (5)
		endes		endum	output

Consider, now, a strong declension neuter ja-noun:

(7) Neuter

Sg.

wīte 'punishment'

wīte

wītes

wīte

Pl.

wītu

wītu

wīta

wītum

Comparison of the nom./acc. pl. wītu with sċipu and word in (1) is of some interest. Traditional grammarians have made use of the notion of a long syllable to account for certain instances of vowel loss. Long syllables are those containing a long vowel or any vowel followed by two or more consonants. Given this definition, the dropping of -u in word but not in sċipu is explicable. However, the failure of -u to drop in wītu is not. If we suppose that wītu derives from a more abstract wīte + u, then the failure of -u to drop in nom./acc. pl. wītu is

completely parallel to its failure to drop in nom./acc. pl. sċipu; i.e., in both instances the final -u is preceded by a syllable containing a lax vowel. In order to postulate an abstract wīte + u , however, it is necessary to have a vowel deletion rule. In fact, just the deletion rule already postulated to account for ende.

In order to maintain the parallel between wītu and sċipu over against word it will be necessary to order u-dropping before (5) Vowel Deletion:

(8)	nom/acc. pl.	word + u	sċip + u	wīte + u	
		Ø	n/a	n/a	by u-dropping
				Ø	by (5) Vowel Del.
		word	sċipu	wītu	output

h-Deletion

We now turn to a second rule of OE phonology which is also motivated by certain facts surrounding pure a-nouns, in particular the so-called contracted pure a-nouns:

(9)

	Masculine
Sg.	
	mearh 'horse'
	mearh
	mēares
	mēare
Pl.	
	mēaras
	mēaras
	mēara
	mēarum

The presence or absence of -h in this paradigm is the most obvious phonological process which requires explanation. Given our earlier analysis of a-noun endings as those in (2), it is apparent that the presence of the -h is a function of the absence of a following vowel initial ending. Thus, assuming a stem of the form mearh, we must postulate a rule which deletes this h intersonorantly:

(10) h-Deletion[3, 4]

$$h \longrightarrow \emptyset \;/\; [+son] \_\_\_\_ [+son]$$

A typical derivation is:

(11)	mearh + Ø	mearh + es	
	n/a	Ø	by (10) h-Deletion
	mearh	meares	output

Let us consider now two other pure a-nouns of the contracted variety:

(12)	Masculine	Neuter
Sg.		
	sc̄oh 'shoe'	feoh
	sc̄oh	feoh
	sc̄os	feos
	sc̄o	feo
Pl.		
	sc̄os	feo
	sc̄os	feo
	sc̄ona[5]	feona
	sc̄om	feom

The presence of stem final -h in the nom./acc. sg. sc̄oh parallels nom./acc. sg. mearh. But there the parallel ends. Whereas mearh shows the vowel of the various endings in the surface forms of the paradigm, sc̄oh does not. Rather, in its paradigm if the ending is of the form -VC, then it is the -C only which appears in the surface form. If the ending is of the form -V, then it disappears altogether from the surface.

The problem, then, is how to account for the oblique cases of sc̄oh. Consider, for example, the gen. sg. which appears as:

(13) sc̄oh + es

The only rule postulated thus far that will apply to this string is (10) h-Deletion, which will delete the intersonorant -h- to yield:

(14)		
	sc̄oh + es	
	Ø	by (10) h-Deletion
	*sc̄oes	output

Notice that (5) Vowel Deletion cannot apply to (14) since it deletes [- stress] vowels in prevocalic position. In any event, it would be fruitless to attempt to modify (5) Vowel Deletion so that it would apply to the output string of (14) since the only modification that (5) Vowel Deletion could yield would be an incorrect *sc̄es.

Consider in this respect the second paradigm exhibited in (12). Assuming the orthographic sequence eo to represent a sequence of two vowels - at least at the point when (5) Vowel Deletion might apply - a wrong output is produced:

(15)	feoh + es	gen. sg.
	Ø	by (10) h-Deletion
	Ø	by (5) Vowel Deletion
	*fees	output

If one were to devise some way of blocking (5) Vowel Deletion from applying in a derivation like (15), one would still be no better off since an incorrect output would still result:

(16) feoh + es — gen. sg.
Ø — by (10) h-Deletion
(Vowel Deletion somehow blocked)
*feoes — output

We see, then, that in the face of contract a-nouns like those in (12), we must suppose that a phonology of OE which contains only (10) h-Deletion and (5) Vowel Deletion is inadequate. Somehow the vocalic segments of the oblique case endings must be deleted in the so-called contracted a-nouns and (5) Vowel Deletion cannot do the job.

We shall leave this unsolved problem for the moment and turn to another segment of OE phonology. There is a phenomenon among the verbal paradigms of OE which is comparable to the contracted a-nouns. The verbs of OE are traditionally divided into two major classes, the strong verbs and the weak verbs. In what follows we shall have occasion to discuss both of these types. At this point we focus on the strong verbs. These verbs are so-called because they exhibit ablaut variation corresponding to tense change. They are, in short, the OE ancestors of modern English ablauting verbs like ride: rode: ridden, take: took: taken and so on. There are, in OE, seven ablaut classes, each one representing a different ablaut variation. Several of these classes contain infinitives without an internal -h- alternating with certain verb forms with a stem final -h. These verbs are traditionally called contracted strong verbs and they exhibit a phenomenon parallel to that of the contracted a-nouns. Contracted verbs occur in four of the seven classes of strong verb:

(17) Class I: wrēon 'cover'
lēon 'grant'
þēon 'thrive'
sēon 'sieve'
tēon 'accuse'
Class II: flēon 'flee'
tēon 'draw'
Class V: gefēon 'rejoice'
plēon 'risk'
sēon 'see'
Class VI: flēan 'slay'
lēan 'blame'
slēan 'slay'
þwēan 'wash'

Class VII: fōn 'take'
hōn 'hang'

These verbs all show alternations with a stem final -h and/or -g. For example, the past tense of Class I Strong Verb wrēon is wrah. The past plural is wrigon, the past participle wrigen. These alternations are illustrative of the operation of Verner's Law in OE, the h-g alternation with -g- appearing in the past plural and in the past participle being a characteristic of this process. In what follows no attempt to formulate this law will be made.

The infinitives of the forms we are considering, then, exhibit a medial -h- which appears in the past singular as -h and in the past plural and participle as -g-. This medial -h- does not appear at the surface, however. We can represent the infinitives as containing this -h- at a somewhat more abstract stage as follows:[6, 7]

(18) Class I: wrēoh + an
Class II: flēoh + an
Class V: seoh + an
Class VI: flēah + an

Evidence for the medial -h- in the forms in (18) is not merely its alternation with -g- under the OE reflex of Verner's Law. Consider, for example, the various forms of the present tense of sēon:[8]

(19) Present
Indicative
Sg.
1. sēo ''I see'
2. siehst 'you see'
3. siehþ 'he sees'
Pl. seoþ 'we/you/they see'
Subjunctive
Sg.
1. sēo
2. sēo
3. sēo
Pl. seoþ
Imperative
Sg. seoh
Pl. seoþ
Participle
seonde

Here the postulated underlying -h- actually appears on the surface in the 2nd and 3rd pers. sg. and in the imperative sg.

In terms of the rules we have been working with thus far, the absence of the -h- in the infinitival forms follows automatically. The -h- appears intervocallically and in this environment it drops:

(20) seoh + an

Ø by (10) h-Deletion

Observe that in a verb like wrēon the appearance of a medial -g- in the past plural and past participle indicates that Verner's Law must precede (10) h-Deletion; otherwise, the medial -h- in those forms will delete incorrectly:

(21) wrih + on past plural

g by Verner's Law

n/a (10) h-Deletion

The stem final -h of the past tense 1st and 3rd pers. sg. will, of course, not be affected by (10) h-Deletion; namely, wrāh.

While there is sufficient evidence to motivate an intervocalic -h- among the contracted verb stems and while this evidence constitutes independent motivation for (10) h-Deletion - on the basis of the contracted verbs alone, were we not to have (10) already available to us, we should have to create it - there is still a problem remaining. Return, for a moment, to the derivation in (20). After (10) h-Deletion has applied, (5) Vowel Deletion can then apply to delete the stem final -o. However, as the following derivation indicates, this is an incorrect result:

(22) seoh + an

Ø by (10) h-Deletion

Ø by (5) Vowel Deletion

*sean output

Reversing the order will not help since the only effect of this move will be to prevent (5) Vowel Deletion from applying altogether. This yields an incorrect *seoan. And, of course, all of these results generalize to all of the contracted strong verbs listed in (17) above.

We see, then, that as with the contracted a-nouns, the contracted strong verbs show that a phonology of OE which contains only (10) h-Deletion and (5) Vowel Deletion is inadequate. With respect to the contracted verbs, somehow the vocalic segment of the infinitival marker -an must be deleted just in case an intervocalic -h- has also been deleted. This is parallel to the contracted a-nouns where the vocalic segments of the oblique case endings must be deleted just in case an intervocalic -h- has also been deleted. And in both cases (5) Vowel Deletion cannot do the job. We are left, then, with a second unsolved

problem concerning vowel deletion. At this point we shall turn to another segment of OE phonology, leaving the resolution of these problems until later.

Motivation of a Stem Extension

Recall that it was stated above that OE verbs are traditionally divided into two major classes. We have already discussed strong verbs and we turn now to weak verbs. These verbs are characterized by a uniform stem throughout the entire conjugation. Thus, whereas strong verbs exhibit ablaut variation from present to past tense, weak verbs do not. Rather, they indicate past tense by the addition of a dental affix. This affix follows the stem and is itself followed by the various personal endings. These weak verbs are the ancestors of modern English verb alternations like glide:glided, seed:seeded and so on. In OE there are three such classes of weak verb, distinguished by certain characteristics. One verb, a member of Class I weak Verbs, is nerian 'to save':

(23) Present

Indicative

Sg.

1. nerie
2. nerest
3. nereþ

Pl. neriaþ

Subjunctive

Sg. nerie

Pl. nerien

Imperative

Sg. nere

Pl. neriaþ

Infinitive

nerian

Participle

neriende

Preterite

Indicative

Sg.

1. nerede
2. neredest
3. nerede

Subjunctive

Sg. nerede

Pl. nereden

Participle

genered

Focussing on the indicative forms and assuming an abstract stem neri- , we can factor out the following verbal endings:

(24) Present

Indicative

Sg.

1. -e

2. -st

3. -þ

Pl. -aþ

Subjunctive

Sg. -e

Pl. -en

Imperative

Sg. Ø

Pl. -aþ

Infinitive

-an

Participle

-ende

There are two well-known processes in OE which interact with Class I Weak Verbs. The processes are palatalization and mutation and each of them points toward the necessity for postulating a stem extension marker -i- which must be supposed to appear following the stem throughout the present tense of weak verbs. Thus, the underlying form for nerie 'I save' would be:

(25)

neri	+	i	+	e
stem		extension marker		1st per. sg. ending

We turn now to the first of these processes, palatalization. This is a phenomenon whereby velar consonants are palatalized after a front vowel.

This process is still productive in OE and can be seen, for example, in the various parts of the Class II Strong Verb *čēosan* 'to choose' , where the symbol *-č-* represents a palatalized consonant:

(26)
čēosan	(infinitive)
čēos	(1st and 3rd pers. sg. past tense)
curon	(2nd pers. sg. past tense and all pl. past)
coren	(past participle)

The *-č-/-c-* (=/k/) alternation is dependent upon the presence or absence of a following front vowel. The rule for palatalization is:

(27) Palatalization

$$\begin{bmatrix} +\text{obstr} \\ +\text{high} \end{bmatrix} \longrightarrow \begin{bmatrix} -\text{back} \\ +\text{cor} \end{bmatrix} \; / \; \underline{\qquad} \; \begin{bmatrix} +\text{syl} \\ -\text{back} \end{bmatrix}$$

The operation of this rule can also be found in Class I Weak Verbs such as *þenčan* 'to think':

(28)
þenčan	(infinitive)
þōhte	(1st and 3rd pers. sg. past tense)
þōht	(past participle)

The appearance of the velar spirant *-h-* before the past tense marker *-t-* is due to a special rule of OE phonology, a relic of Grimm's Law which we represent mnemonically as:

(29) Grimm's Law

$$k \longrightarrow h \; / \; \underline{\qquad} \; t$$

This requires, of course, that the stem contain a /k/, i.e., *þenk-*. Assuming a vocalic marker in the infinitive form, the derivation of the surface *þenčan* must proceed as follows:

(30)
þenk + i + an	
č	by (27) Palatalization
ø	by (5) Vowel Deletion
þenčan	output

(27) Palatalization must precede (5) Vowel Deletion; otherwise the front vowel which triggers palatalization will have been deleted before palatalization can have taken place.

The stem in (30) consists of a lax vowel followed by two consonants. A stem which contains a tense vowel which illustrates the same phenomenon is *sēčan* 'to seek':

(31) sēk + i + an

č	by (27) Palatalization
ø	by (5) Vowel Deletion
sēčan	output

In both of these stem types it is necessary to suppose a stem extension marker -i- in the present tense in order to account for the consonantal alternations just discussed. This stem extension is needed to account for an additional alternation as well.

The chief characteristic of weak verbs is the unchanging quality of the vowel through the tenses, and yet in both of the verbs just examined, and in several other examples as well, there is an ē/ō alternation which contradicts the absence of vowel ablaut in weak verbs. This alternation can be accounted for automatically by the postulated stem extension marker -i- if one assumes that the historical process of i-mutation was still productive in OE. This process was one which fronted stressed back vowels before a following front vowel or glide. The rule can be stated as:

(32) i-mutation

$$[+\text{syl}] \longrightarrow [-\text{back}] \;/\; \left[\frac{\qquad}{+\text{stress}}\right] C_o \begin{bmatrix} -\text{cons} \\ +\text{high} \\ -\text{back} \end{bmatrix}$$

Assuming, then, an underlying sōk- , we have the following derivation:

(33)

sōk + i + an	sōk + t + e	
n/a	h	by (29) Grimm's Law
č	n/a	by (29) Palatalization
ē	n/a	by (32) i-mutation
ø	n/a	by (5) Vowel Deletion
sēčan	sōhte	output

Similarly, þenčan would undergo the following derivation in the present tense:

(34) þonk + i + an

č	by (27) Palatalization
e	by (32) i-mutation
ø	by (5) Vowel Deletion
þenčan	output

The presence of -o- in the past tense þōhte follows from the absence of a stem extension marker in the past tense. However, the loss of the nasal

-n- and the lengthening of the past tense vowel requires further explanation. We shall return to this below.

In the derivation in (33) Grimm's Law cannot be ordered with respect to any of the other rules mentioned there. However, it is possible to give an argument for the ordering of (27) palatalization and (32) i-mutation shown there. To see this consider the following nominal paradigms taken from the so-called "athematic nouns", a minor OE declension set:

(35) feminine

Sg.		
	studu 'post'	bōc 'book'
	studu	bōc
	*stude	bēċ
	styde	bēċ
Pl.		
	styde	bēċ
	styde	bēċ
	studa	bōca
	studum	bōcum

There are certain properties of these nominal inflections worth noting. First, observe that studu contains a weak stem syllable before the word final -u. This is in contrast to bōc , which contains no stem final vowel and which has a long stem syllable. Note also the various vocalic and consonantal alternations in bōc. In the genitive singular and the dative singular the vowel is ē , a reflex of i-mutation and the final consonant is ċ , a reflex of palatalization. The same alternations are to be found in the nominative and accusative plurals. Based upon the paradigms and these alternations, it seems reasonable to postulate the following set of endings in order to account for these variations:

(36)

Sg.	
	-u[9]
	-u
	-i
	-i
Pl.	
	-i
	-i
	-a
	-um

The postulated dative singular -i is sufficient to trigger mutation of the stem vowel in a stem like stud- to yield styd- as the following derivation shows:

(37) stud + i

y	(32) i-mutation
styde	output

Obviously the derivation in (37) is not quite right. The dative singular ending -i must be lowered since it appears in the output as -e. To accomplish this we shall postulate a lowering rule:

(38) Vowel Lowering

$$\begin{bmatrix} +\text{syl} \\ -\text{back} \end{bmatrix} \longrightarrow \begin{bmatrix} -\text{high} \end{bmatrix} \; / \; \_\_\_\_ \; C_o \; \#$$

We shall see that this rule plays a role in several other areas of OE phonology. At this point, however, we shall restrict ourselves to the role it plays in derivations like (37) which now appear as:

(39) stud + i

y	by (32) i-mutation
e	by (38) Vowel Lowering
styde	output

The nominative and accusative plural forms of this verb proceed exactly as in (39). The genitive singular form which appears starred in (35) is unattested according to Campbell (1959, §623). The expected form is *styde and Campbell cites *stude as a possible form due to analogy. There is no reason to reject an expected *styde, however, and we shall assume this form for the genitive singular.

The postulation of an -i ending for the dative and genitive singular and the nominative and accusative plural will also account for the variations observed in bōc as the following derivation shows:

(40) bōc + i

c̆	by (27) palatalization
ē	by (32) i-mutation
ø	by unspecified rule dropping final -i/-u[10]
bēc̆	output

We come now to the argument for ordering palatalization before i-mutation. Recall first that a form like c̆ēosan shows palatalization (cf. (26) above) with the stressed mid-front vowel ē triggering the fronting of the initial c (=k). If, then, we can find a form in which both rules apply but in which the vowel triggering palatalization is itself due to the operation of i-mutation, then it is possible to determine the proper order between these two rules. There is such a form, namely gōs 'goose' which is declined just like bōc. The crucial form for the argument is the dative singular or nominative and accusative plural which is gēs. The failure of the initial velar g- to palatalize in front of the following

$\bar{e}$ indicates that the derivation must proceed as follows:

(41) gōs + i

n/a	by (27) palatalization
ē	by (32) i-mutation
Ø	by unspecified rule dropping final -i/-u
gēs	output

If, in the above derivation, (32) were to apply before (27), then one would expect an incorrect *gēs as the output. Thus, the order which appears in (41) is established.

Vowel Deletion Modified

The operation of (27) palatalization and (32) i-mutation in the weak verbs strongly supports the introduction of a stem extension marker -i-. Obviously such an extension ought to appear most generally throughout the weak verb system. At this point, assuming the extension to appear in the present tense system (leaving to one side the question of whether the extension marker should appear elsewhere in the conjugation as well), it is necessary to modify rule (5).

Consider the underlying sequence of formatives for the 1st pers. sg. nerie cited in (25) and repeated here in the following derivation:

(42) neri + i + e

Ø	by (5) Vowel Deletion
nerie	output

The difficulty is that as (5) is stated it will only delete prevocalic vowels which are themselves in the final syllable of a sequence. But consider, for example, the underlying sequence for the present participle:

(43) neri + i + ende

(5) Vowel Deletion will fail to apply to this sequence and an incorrect *neriiende will result. To rectify this, (5) can be modified in the following fashion:

(44) Vowel Deletion (final version)

$$V \longrightarrow \emptyset \quad \left[\frac{\qquad}{-\text{ stress}} \right] \; V \; (CX) \; \#$$

The environment _____ V(CX) # which appears in (44) expresses the fact that vowel deletion takes place in two separate environments; namely, when the vowel to be deleted precedes either a ____VC sequence or else a ____V # sequence. These two environments are collapsible as ____ V (CX) # and are, by the parenthesis notation, disjunctively ordered.[12]

The modification is required in order to allow vowel deletion to take place in the present participle:

(45) neri + i + ende
Ø by (44) Vowel Deletion
neriende output

That (44) Vowel Deletion will yield correct forms for the remaining indicative forms is illustrated below:

(46) a. neri + i + st (2nd pers. sg.)
Ø by (44) Vowel Deletion
e by (38) Vowel Lowering
nerest output

b. neri + i + aþ (all pers. pl.)
Ø by (44) Vowel Deletion
n/a by (38) Vowel Lowering
neriaþ output

(47) neri + i (2nd pers. sg. imp.)
Ø by (44) Vowel Deletion
e by (38) Vowel Lowering
nere output

The remaining forms, the subjunctive, infinitive, plural imperative and 3rd pers. sg., all exhibit strings structurally identical to those already considered and are correctly derived in parallel fashion.

Notice, also, that the derivations given in (45a) and (46) above provide independent motivation for the rule of vowel lowering stated as (38) above.

Gemination

At this point we turn our attention to yet another phenomenon characteristic of Class I Weak Verbs; namely, the process whereby single consonants are doubled in certain forms of the paradigm. This process does not in itself motivate a stem extension marker -i-. However, the postulation of that marker will influence the statement of the gemination rule. The following Class I Weak Verb illustrates the phonomenon in question:

(48)

Present

Indicative

Sg.

1. fremme 'I do'
2. fremest
3. fremeþ

Pl.

fremmaþ

Subjunctive

Sg.

fremme

Pl.

fremmen

Imperative

Sg.

freme

Pl.

fremmaþ

Infinitive

fremman

Participle

fremmende

Past

Indicative

Sg.

1. fremede
2. fremedest
3. fremede

Pl.

fremedon

Participle

fremed

A glance at this conjugation indicates that one of its major features is the appearance of geminate consonants in certain of the forms, notably the 1st pers. sg. pres. ind., the pl. ind., all forms of the subjunctive, the pl. imp., and the infinitive and present participle. This process of gemination within Class I Weak Verbs like fremman is quite widespread. Thus, verbs like cnyssan 'knock', hrissan 'shake', swebban 'kill', weċġan 'move', etc. exhibit precisely the same alternations of single and double consonants. This behavior is to be contrasted with nerian (cf. (23)) on the one hand and with Class I Weak Verbs like dēman 'judge', hīeran 'praise', drenċan 'drink', wendan 'turn' and, of course, seċan and benċan, which we have just examined in another context.

Gemination of a single consonant only takes place when that single consonant immediately follows a short vowel. Thus, sēċan does not exhibit gemination since the -ċ- follows a long vowel. Similarly, the -ċ- in benċan does not geminate since the -ċ- does not follow a lax vowel.[13]

In order to see how to differentiate the geminating from the non-geminating environments throughout the conjugations of those verbs which do geminate, we shall examine in some detail fremman. Recall that the stem of this form can be deduced from the imperative sg. form which is assumed to take the following underlying shape:

(49) fremi + i + Ø
stem extension pers. ending

The derivation of the surface freme proceeds in a straightforward fashion:

(50) fremi + i + Ø
Ø by (44) Vowel Deletion
e by (38) Vowel Lowering
freme output

Let us now reconstruct the 1st pers. sg. pres. ind. underlying form:

(51) fremi + i + e
stem extension pers. ending

And compare this with the reconstructed 2nd pers. sg. pres. ind.:

(52) fremi + i + st
stem extension pers. ending

(51) geminates but (52) does not. And the apparent difference between the two underlying forms is that in the string which geminates, the stem is followed by a double vowel sequence, while in the string which does not geminate the stem is followed by a single vowel followed by a consonant cluster. Building this into a rule along with the observation that only single consonants after a lax vowel geminate, we may formulate gemination as follows:

(53) Gemination

$$\begin{bmatrix} V \\ +\text{stress} \\ -\text{long} \end{bmatrix} \quad Ci + \begin{bmatrix} +\text{syl} \end{bmatrix} + \begin{bmatrix} +\text{syl} \end{bmatrix}$$

1 23 4 5 $\Longrightarrow$

1 22 4 5

condition: 2 $\neq$ /r/

The choice of stating this rule as a transformation rather than as an insertion rule is dictated by the fact that an insertion rule would have to be accompanied by a vowel deletion rule. (53) collapses these two processes and therefore captures the relationship between the appearance of a geminate consonant and the loss of the -i- which originally followed the consonant which was geminated. The derivation of fremme (1st pers. sg. pres. ind.) proceeds as:

(54) fremi + i + e

m by (53) Gemination

Ø by (44) Vowel Deletion

fremme output

A similar derivation proceeds for the pl. pres. ind. (= pl. imp.):

(55) fremi + i + aþ

m by (53) Gemination

Ø by (44) Vowel Deletion

fremmaþ output

Thus, any vowel initial ending throughout the present tense will trigger gemination. This includes the infinitival ending -an, the present participle ending -ende, the subjunctive endings -e (sg.) and -en (pl.), and excludes the 2nd per. and 3rd pers. sg. present tense and the imperative sg. We have already seen how the latter is derived, i.e., under the assumption that the 2nd pers. sg. imp. is equivalent to the bare stem of the verb plus the stem extension marker -i-. The derivation of the 2nd and 3rd pers. sg. present tense is:

(56)

fremi	+	i	+	st	fremi	+	i	+	þ	
		n/a				n/a				by (53) Gemination
		Ø				Ø				by (44) Vowel Deletion
			e					e		by (38) Vowel Lowering
		fremest				fremeþ				output

Class II Weak Verbs

We have seen three separate processes which operate in Class I Weak Verbs, namely palatalization, i-mutation and gemination. Rather strikingly, however, none of these processes appear to operate in Class II Weak Verbs. Consider, for example, the Class II Weak Verb lufian 'to love'. This verb shows neither i-mutation (the mutation product of -u- is -y-) nor gemination. That is, we find a surface lufian and not a surface *lyffan, despite the fact that the stem is itself structurally susceptible to these processes and is apparently in the correct environment, i.e. it precedes an -i-. There are several verbs which are apparent exceptions to these processes:

(57) macian 'make' þancian 'thank' āscian 'ask'
stician 'stick' locian 'look'

Each of the verbs in (57) should undergo palatalization, but none of them do. Each of the verbs (except stician) should show the effects of i-mutation, but none of them do. Finally, the verbs macian and stician, like lufian, should undergo gemination but do not. Indeed, Class II Weak Verbs are exceptions to all of these processes. In order to understand why these processes are apparently inapplicable to this verb class, let us consider the full conjugation of the verb lufian:[14]

(58) Present

Indicative

Sg.

1. lufiu
2. lufast
3. lufaþ

Pl.

lufiaþ

Subjunctive

Sg.

lufie

Pl.

lufien

Imperative

Sg.

lufa

Pl.

lufiaþ

Infinitive

lufian

Participle

lufiende

Past

Indicative

Sg.

1. lufade

2. lufadest

3. lufade

Pl.

lufadon

Subjunctive

Sg.

lufade

Pl.

lufaden

Participle

lufad

Recall that in our discussion of nerian, we postulated a stem which was identical with the 2nd pers. sg. imp. form of the verb. This would lead us to suppose that the stem underlying the verb lufian and all verbs of the Class II Weak Verb variety contains a stem final -a since the imperative form is lufa. Historically this is a consistent analysis since all verbs of this class are denominative in origin, being formed from nouns belonging to the Gmc. ō declension. The OE reflex of Gmc. ō is a and its appearance in the stems of Class II Weak Verbs is not unexpected. It is presumably this -a- which appears not only in the imperative lufa but in the various other forms of (58); e.g. the 2nd and 3rd pers. sg. pres. ind. and throughout the past tense.

The -i- which appears in certain other forms, for example, the 1st pers. sg. pres. ind. lufiu, is most naturally associated with the stem extension marker -i- postulated for Class I Weak Verbs. This suggests an underlying form for the infinitive and for the 1st and 2nd pers. sg. pres. ind. as follows:

(59)	a.	lufa	+	i	+	an	(infinitive)
		stem		extension		ending	
	b.	lufa	+	i	+	u	
		stem		extension		ending	
	c.	lufa	+	i	+	st	
		stem		extension		ending	

An immediate consequence of the underlying forms in (59) is that they automatically account for the absence of the three processes which appear in Class I Weak Verbs, palatalization, i-mutation, and gemination.

Given sequences such as those which appear in (59), none of these rules are applicable. Thus, (53) Gemination requires that a stem final -i-

be present and in (59) the stem final -a- blocks gemination. (32) i-mutation requires that the vowel which precedes the -i- must be [+ stress] in order to undergo mutation and the stem final -a- is [- stress] . Finally, consider an infinitival form like macian which apparently should undergo all of these processes and palatalization as well:

(60) maca + i + an
stem extension ending

The presence of the stem final -a- blocks (27) Palatalization since that rule requires that the consonant which is to undergo the rule must immediately precede the -i- vowel. And, as we have seen, this stem final -a- also blocks (32) i-mutation and (53) Gemination.

We see, then, that there is good reason to postulate a stem final -a- in Class II Weak Verbs. However, while this move is a desirable one, it is not without problems. Thus, given a string like that in (60) and like those in (59), precisely the wrong results appear on the surface once (44) Vowel Deletion is allowed to apply:

(61)	lufa + i + an	lufa + i + u	
	n/a	n/a	by (32) i-mutation
	n/a	n/a	by (27) Palatalization
	n/a	n/a	by (53) Gemination
	Ø	Ø	by (44) Vowel Deletion
	*lufaan	*lufau	output

The 2nd pers. sg. pres. ind. form does not fare any better:

(62)	lufa + i + st	
	n/a	by (32) i-mutation
	n/a	by (27) Palatalization
	n/a	by (53) Gemination
	Ø	by (44) Vowel Deletion
	e	by (38) Vowel Lowering
	*lufest	output

We find ourselves, then, in a position reminiscent of that relating to the contract a-nouns and the contract strong verbs; namely, we have an analysis which fares rather well right up to but not including (44) Vowel Deletion. This rule either offers no help as in the former two cases or offers unwanted help as in the case under examination. This, then, constitutes our third problem which concerns derivations in which too many vowels appear with insufficient mechanisms to delete the correct ones. What all three problems have in common is just this: a derivation proceeds to a point where two or three vowels are contiguous, and there is need to delete one or another of these vowels in order to yield a correct result.

At this point we shall not pause to see how this might be accomplished. Rather, we shall turn to yet another region of OE phonology.

Class III Weak Verbs

Class III Weak Verbs consist mainly of four verbs, libban 'live', habban 'have', sec̆̈gan 'say', and hyc̆̈gan 'think'. These verbs show a remarkable variety of forms throughout the various dialects of OE, a fact due in large measure to an ambiguous surface paradigm. This ambiguity is because the verbs share features of both Class I Weak Verbs and Class II Weak Verbs. A glance at the forms for libban and habban illustrates this:

(63)

Present		
Indicative		
Sg.		
	1. libbe	hæbbe
	2. leofast	hafast
	3. leofaþ	hafaþ
Pl.	libbaþ	habbaþ
Subjunctive		
Sg.	libbe	hæbbe
Pl.	libben	hæbben
Imperative		
Sg.	leofa	hafa
Pl.	leofaþ	hafaþ
Infinitive		
	libban	habban
Participle		
	libbende	hæbbende
Preterite		
Indicative		
Sg.		
	1. lifde	hæfde
	2. lifdest	hæfdest
	3. lifde	hæfde
Pl.	lifdon	hæfdon
Subjunctive		
Sg.	lifde	hæfde
Pl.	lifden	hæfden
Participle		
	lifd	hæfd

Notice that the forms in (63) resemble Class I Weak Verbs like fremman (cf. (48) above) in that they show gemination in the corresponding verbal forms throughout the present system; namely, in the present participle, in the infinitive, the 1st pers. sg. and the pl. pres. indicative and the pres. subjunctive. However, in the remaining forms the verbs appear to resemble Class II Weak Verbs like lufian; namely, in the second and third pers. sg. present indicative and in the imperative. The problem raised by these various forms is this: How is it possible for these verbs to act in some instances like Class I Weak Verbs and in others like Class II Weak Verbs?

In order to see what is involved in this question it is necessary to digress for a moment to consider certain of the alternations which appear in (63). Let us consider, first, the -bb-/-f- alternations in the geminate and nongeminate forms. To begin with the presence of an -f- spelling in leofast, lifde, hafaþ, hæfde, etc. beside the -bb- spellings in libban, libbe, habban, hæbbe, etc. point to an underlying stem which contains a continuant. Thus, the -f- appears both intervocalically and preconsonantally. It is only when the -f- is geminated that a -bb- appears. This suggests an underlying continuant consonant which becomes noncontinuant when geminated. (Cf. Wagner 1969, 163 ff.) Moreover, the -bb- spellings suggest that the underlying consonant is, in fact, a voiced continuant. If one recalls that OE had no f and v contrast, then the use of f throughout the forms in (63) for a voiced continuant is not surprising.

The eo/i alternations which appear in libban are due to a process of diphthongization which occurs in many OE dialects whereby a high front vowel is diphthongized and lowered in the presence of a back vowel in the following syllable. This accounts for the diphthong in leofast and its absence in libbe, for example. In the derivations to follow we shall refer to this process by name only, without attempting to formalize it.

The vocalic alternations which appear in habban are of a somewhat different nature. If one assumes an underlying æ as basic - based upon forms like hæbbe - then the appearance of a in hafast can be accounted for in terms of another independently motivated process in OE whereby front æ is backed due to a back vowel in the following syllable. Thus, in the nominal paradigm for the word 'day', nominative sg. dæg alternates with nominative plural dagas and dative sg. dæge alternates with dative plural dagum. This same process can be made to account for hæbbe with no following back vowel beside hafast with a following a. We shall assume a rule of assimilation to back vowels without attempting to formalize it.

The occurrence of forms like hafast and leofast, therefore, strongly suggest that we postulate an underlying hæfa and lifa as stems because of the parallel to Class II Weak Verbs like lufian which exhibits leofast as as the 2nd pers. sg. form. Moreover, just as the imperative sg. of lufian is lufa, so too are the imperative sg. forms of habban and libban hafa and leofa, respectively. All of this suggests that, parallel to lufian, we set up the following:

(64)	stem		extension		ending	
a.	{hæfa / lifa}	+	i	+	an	(inf.)
b.	{hæfa / lifa}	+	i	+	e	(1st. pers. sg.)
c.	{hæfa / lifa}	+	i	+	st	(2nd pers. sg.)
d.	{hæfa / lifa}	+	i	+	ø	(imp. sg.)

However, such stems postulate a double set of problems. First, they have precisely the same problems attendant upon the Class II Weak Verbs (cf. (61) and (62) above) in that (44) Vowel Deletion will delete the wrong vowel in (64c.-d.) yielding an incorrect *hæfest and *hæfe as well as *lifest and *life. The second set of problems raised by these stems is that the postulation of a stem final hæfa and lifa will prevent gemination from applying to the sequences in (64a.-b.); namely, in precisely those sequences where gemination occurs in Class III Weak Verbs.

Before we consider a possible solution to the several problems discussed above, let us briefly summarize them:

(65) 1. How to account for the oblique cases of nouns like sc̄oh which, after undergoing (10) h-deletion, show strings like *sc̄oes; i.e. strings to which (44) Vowel Deletion will not apply.

2. How to account for the contracted verbs like seon which, after undergoing (10) h-deletion, show strings like *seoan; i.e. strings to which (44) Vowel Deletion will incorrectly apply to yield an incorrect *sean.

3. How to account for Class II Weak Verbs like lufian which require a stem final -a- to prevent (27) Palatalization, (32) i-mutation and (53) Gemination from applying but which, because of the stem final -a- and the stem extension -i-, yield sequences such as lufa + i + st which are incorrectly operated on by (44) Vowel Deletion to produce the incorrect surface form *lufest.

4. How to account for Class III Weak Verbs like libban and habban which, because of their resemblance to Class II Weak Verb forms require a stem final -a- but which, because of their resemblance to Class I Weak Verbs as well, require a stem final -i-.

A Proposed Solution

In order to see a possible solution to the several problems described above and summarized in (65), let us consider first the problem in (65.3); namely, the difficulties raised by Class II Weak Verbs. We have seen the need for postulating a stem final -a and thus for postulating an underlying sequence for, say, the imperative sg. of this verb as:

(66) lufa + i + ø
stem extension ending

Now if (44) Vowel Deletion applies to this string, the stem final -a will be incorrectly deleted:

(67) lufa + i + ø
ø by (44) Vowel Deletion
e by (38) Vowel Lowering
*lufe output

In other words in a sequence like lufa + i it is the stem extension -i- which should be deleted and not the stem final -a. Compare this with a sequence like lufa + i + an or lufa + i + u in which it is the stem final -a- which must be deleted and not the stem extension -i-. The problem, then, is how to account for the following complicated deletion pattern: in those strings in which the stem extension -i- is followed by no more than a single vowel, e.g. lufa + i, lufa + i + st, lufa + i + þ, it is the stem extension vowel -i- which must be deleted; however, in those sequences in which the stem final -a- is followed by two vowels, e.g. lufa + i + an, lufa + i + u, lufa + i + aþ, it is the stem final -a- itself which must be deleted.

It is proposed here that this complicated deletion pattern can be accounted for if we add to the phonological grammar of OE a rule of metathesis which metathesizes any nonhigh back vowel with any vowel and that this rule operates prior to the rule of Vowel Deletion. We state the rule as follows:

(68) $X \begin{bmatrix} +\text{syl} \\ -\text{cons} \\ +\text{back} \\ -\text{high} \end{bmatrix} \begin{bmatrix} +\text{syl} \\ -\text{cons} \end{bmatrix} Y$

$1 \quad 2 \quad 3 \quad 4 \Longrightarrow 1 \quad 3 \quad 2 \quad 4$

If this rule is allowed to precede (44) Vowel Deletion, then consider the following derivation of lufa as opposed to that in (67):

(69) lufa + i + ø
i a by (68) Metathesis
ø by (44) Vowel Deletion
lufa output

Moreover, all of the problemmatic forms discussed under the section dealing with Class II Weak Verbs and summarized in (65.3) above cease to be problemmatic under an assumption of (68) Metathesis being part of OE phonology. To illustrate this consider the following typical derivations:

(70) a. lufa + i + an (infinitive)

n/a	by (32) i-mutation
n/a	by (27) Palatalization
n/a	by (53) Gemination
i a	by (68) Metathesis
ø	by (44) Vowel Deletion
lufian	output

b. lufa + i + u (1st pers. sg.)

n/a	by (32) i-mutation
n/a	by (27) Palatalization
n/a	by (53) Gemination
i a	by (68) Metathesis
ø	by (44) Vowel Deletion
lufiu	output

c. lufa + i + st (2nd pers. sg.)

n/a	by (32) i-mutation
n/a	by (27) Palatalization
n/a	by (53) Gemination
i a	by (68) Metathesis
ø	by (44) Vowel Deletion
lufast	output

An example of macian in which palatalization is blocked is the derivation of the infinitive itself:

(71) maca + i + an

n/a	by (32) i-mutation
n/a	by (27) Palatalization
n/a	by (53) Gemination
i a	by (68) Metathesis
ø	by (44) Vowel Deletion
macian	output

In all of the above derivations the presence of the stem final a- before the stem extension -i- is sufficient to block i-mutation, palatalization and gemination from applying incorrectly in Class II Weak Verbs. However, the problem raised by the subsequent application of (44) Vowel Deletion to yield incorrect results is solved by (68) Metathesis, which reverses the order of these crucial vowels prior to (44). And, as we

have just seen, it is precisely the reversed string which is properly operated on by (44). Indeed, it is only in this fashion that it is possible to explain how it is that in the forms in (70a.-b.) it is the stem final -a which must be deleted by (44) while in (69) it is the stem extension -i- which must be deleted while the stem final -a- must remain.

We have just seen how the problems raised by Class II Weak Verbs are solved in terms of a rule of metathesis in OE. It is of some additional interest, therefore, to ask how this rule might interact with the remaining problem areas discussed above. Let us take them in the order in which they appear in this paper, beginning with the oblique forms of sc̄oh. Recall that this form caused difficulty in oblique cases because in those environments intervocalic -h- was deleted leaving a sequence of vowels which were incorrect; i.e. *sc̄oes (gen. sg.), *sc̄oe (dat. sg.), *sc̄oas (nom./acc. pl.), etc. Notice that if we adopt a grammar in which (68) Metathesis applies before (44) Vowel Deletion but after (10) h-deletion, then precisely the correct forms are derived:

(72)	sc̄oh+es	sc̄oh+e	sc̄oh+as	sc̄oh+um	
	ø	ø	ø	ø	by (10) h-deletion
	e ō	e ō	a ō	u ō	by (68) Metathesis
	ø	ø	ø	ø	by (44) Vowel Deletion
	sc̄os	sc̄o	sc̄os	sc̄om	output

Recall from the paradigms in (12) above that sc̄ona (gen. pl.) is not attested though feona is. Both of these forms are derived as follows:

(73)	sc̄oh + ena	feoh + ena	
	ø	ø	by (10) h-deletion
	e ō	e o	by (68) Metathesis
	ø	ø	by (44) Vowel Deletion
	sc̄ona	feona	output

It is worth noting in passing that the modification of (44) Vowel Deletion described above is needed to account for the vowel deletion in these derivations as well.

We see, then, that (68) Metathesis not only accounts for the problems attendant upon the above discussion of Class II Weak Verbs, but also for those surrounding nouns like sc̄oh. Let us turn, now, to the problems dealt with in the discussion of contract verbs.

The difficulty with contract verbs like seon, which required a more abstract representation as seohan, is that (44) Vowel Deletion applies incorrectly. This was illustrated in (22) above. Let us now revisit this derivation, making use of (68):

(74) seoh + an (Class V Strong Verb)

ø	by (10) h-deletion
a o	by (68) Metathesis
ø	by (44) Vowel Deletion
seon	output

As the following derivations show the solution illustrated in (74) generalizes to all of the contract verbs cited in (17) (leaving Class VI fōn and hōn to one side for the moment):

(75)

I. wrēoh+an	II. flēoh+an	VI. flēah+an	
ø	ø	ø	by (10) h-deletion
a o	a o	a a	by (68) Metathesis
ø	ø	ø	by (44) Vowel Deletion
wrēon	flēon	flēan	output

The derivations in (74) and (75) show that the addition of (68) Metathesis to our grammar will account for the problems raised in our earlier discussion of these contract verbs. Let us now turn to the remaining two contract verbs, fōn and hōn.

These verbs belong to Class VII Strong Verbs, which is composed of verbs which have the same stem in the present tense and in the past participle, which stem differs from the past sg. and past pl. stem. The principle parts are:

(76)

present	past	past participle
fōn	fēng	fangen
hōn	hēng	hangen

The presence of -g- in the past and past participle can be, as we have seen, a reflex of an abstract -h-, alternating with -g- by the reflex of Verner's Law in OE. The presence of -an- in the past participle leads one to postulate the same sequence in the present stem, as this is the pattern for this class of strong verb. Thus, the infinitival forms of hōn and fōn, at a more abstract level, are:

(77) fanh + an hanh + an

Further evidence for the underlying -h- is that it appears in the surface in the 2nd and 3rd pers. sg. present tense forms and in the imperative:[16]

(78)

fēhst	hēhst	2nd pers. sg.
fēhþ	hēhþ	3rd pers. sg.
fōh	hōh	imp. sg.

The change of -an- to -ō- in the present tense requires a special rule which performs the change before -h-. Let us call this rule nasal-drop and not attempt to formalize it for the moment. Given such a rule, the derivation of fōn and hōn proceeds as follows:

(79)	fanh + an	hanh + an	
	ō	ō	by nasal-drop
	ø	ø	by (10) h-deletion
	a ō	a ō	by (68) Metathesis
	ø	ø	by (44) Vowel Deletion
	fōn	hōn	output

Recall that certain Class I Weak Verbs (cf. (34) above) exhibit loss of a nasal consonant before -h- in the past tense stem:

(80)	infinitive	past	past participle
	brengan 'bring'	brōhte	brōht
	þenčan 'think'	þōhte	þōht
	þynčan 'seem'	þūhte	þūht

The past tense of these forms can be supposed to consist of the following abstract sequences which undergo the derivations illustrated:

(81)	brong + te	þonk + te	þunk + te	
	h	h	h	by (29) Grimm's Law
	ōø	ōø	ūø	by nasal-drop
	brōhte	þōhte	þūhte	output

That is, if the rule of nasal-drop is generalized to -on- and -un- sequences before -h-, as well as applying to -an- sequences, then the long -ō- of fōn and hōn and the long vowels of the past forms in (80) above are a result of the same phonological rule. We can state this rule as follows:

(82) $$\begin{bmatrix} +\text{syl} \\ +\text{back} \end{bmatrix} \quad [+\text{nasal}] \quad \begin{bmatrix} -\text{syl} \\ +\text{back} \\ +\text{cont} \end{bmatrix}$$

$$1 \qquad 2 \qquad 3 \Rightarrow \begin{bmatrix} 1 \\ +\text{long} \\ -\text{low} \\ +\text{round} \end{bmatrix} \quad ø \quad 3$$

Thus, there is independent motivation for (82). We see, then, that (68) Metathesis takes place in the derivations of fōn and hōn, Class VII contracted strong verbs, as it does in the other strong class contracted verbs illustrated in (17) above.[17]

We turn now to the last of the problems discussed above and summarized in (65.4). Recall that here the problem is to determine how it is possible for Class III Weak Verbs to appear sometimes like a Class I Weak Verb and other times like a Class II Weak Verb in view of the apparent necessity for postulating underlying stems of the form lifa and hæfa for the verbs in question; namely, libban and habban.

We have seen thus far that it is necessary to suppose that (68) Metathesis follows (53) Gemination in order to account for the absence of the latter phenomenon in Class II Weak Verbs. Consider, therefore, the derivations of the infinitives in question:

(83)	lifa + i + an	hæfa + i + an	
	n/a	n/a	by (53) Gemination
	i a	i a	by (68) Metathesis
	ø	ø	by (44) Vowel Deletion
	*lifian	*hæfian	output

Assuming the normal order as applied in (83), we are unable to account for the correct surface forms. It is striking, however, that if (68) Metathesis were ordered before (53) in these derivations the correct output is derived:

(84)	lifa + i + an	hæfa + i + an	
	i a	i a	by (68) Metathesis
	bb	bb	by (53) Gemination
	ø	ø	by (44) Vowel Deletion
		a	by back vowel assimilation
	libban	habban	output

The operation of (68) brings the stem extension -i- into stem final position where it can then trigger (53) which applies next. The cost of this solution is the necessity for postulating a special ordering. However, this special ordering enables us to capture what seems to be the appropriate generalization for these two infinitives; namely, that the processes which operate in them are the same processes which operate in Class I Weak Verbs.[18] Without (68) Metathesis it would be impossible to allow the rules postulated for the normal portion of OE phonology to apply in these irregular cases as well. Metathesis appears to be precisely the rule which allows us to state how the regular phonological operations of OE, in this instance Gemination, come to apply in Class III Weak Verbs. Notice that this reordering has no ill effect on the remaining forms that need to be accounted for; i.e., those which resemble Class II Weak Verbs:

(85) a. lifa + i + st	hæfa + i + st		
i a	i a		by (68) Metathesis
n/a	n/a		by (53) Gemination
ø	ø		by (44) Vowel Deletion
eo			by back vowel mutation
	a		by back vowel assimilation
leofast	hafast		output
b. lifa + i	hæfa + i		
i a	i a		by (68) Metathesis
n/a	n/a		by (53) Gemination
ø	ø		by (44) Vowel Deletion
eo			by back vowel mutation
	a		by back vowel assimilation
leofa	hafa		output

For completeness, it might be of interest to derive the 1st pers. sg. present tense of these verbs as well:

(86) lifa + i + e	hæfa + i + e		
i a	i a		by (68) Metathesis
bb	bb		by (53) Gemination
ø	ø		by (44) Vowel Deletion
libbe	hæbbe		output

Here the underlying stem vowels appear on the surface as well since no back vowel follows in the following syllable, the back vowels having been deleted by (44) Vowel Deletion.[19]

Conclusion

We have seen that all of the problems summarized in (65) above and described in this article dissolve in the face of (68) Metathesis. The theoretical interest of this solution lies in the rather abstract nature of (68) Metathesis which it is claimed is central to OE phonology, at least in terms of the framework outlined above and yet it is a rule whose output never appears unmodified on the surface. This fact may lead one to suppose that the rule is, therefore, not a possible rule of phonology. However, such a supposition seems to be based upon an excessive reliance on surface data. Rather (68) Metathesis shows that a disparate set of surface phenomena, i.e., Class II Weak Verbs, Class III Weak Verbs habban and libban, contracted strong verbs and contracted a-stem nouns, are relatable at an abstract level. And this in turn reaffirms the degree to which abstractness figures in phonological description.

To paraphrase St. Paul: abstractness is the evidence of things unseen.

Footnotes

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1. The traditional terminology is followed here for the sake of convenience. There is no implication that the traditional divisions such as pure a-noun, ja-noun, wa-noun and so on have any theoretical validity. Indeed, there is much reason to suppose that these categories are no longer of theoretical relevance to a synchronic study of Old English. Since nothing of importance to what follows hangs on this question, however, it shall be left open.

2. The loss of word final -u in neuter a-nouns is usually attributed to a phonological rule which drops this vowel after a strong syllable. Thus, one finds word ⟵ word + u beside scipu ⟵ scip + u. (cf. p. 129 and 130 below). There is, however, a certain amount of evidence which suggests that it is incorrect to state such a rule in terms of a strong syllable environment. Rather the requisite rule appears to require a weak cluster in its environment rather than a strong cluster. This discussion would take us too far afield and in what follows the u-dropping rule will be left unstated. However, it is worth noting here that all other things being equal it is more desirable to be able to account for u-dropping in terms of a weak cluster rule rather than a strong cluster since the former environment can be captured quite simply in the current notation of phonological theory; namely, as $\underline{\check{V}C}$, whereas the latter requires a much more complicated statement; namely, either $\underline{VC_2}$ or $\underline{\overline{V}C_o}$. This problem will be dealt with at length in a later publication.

3. The rule of h-deletion is stated so as to delete an h which is between two sonorants. This anticipates later discussion where it will be seen that the h deletes between two vowels (cf. (12) below as opposed to (11) where the h deletes between a preceding sonorant r and a following vowel segment). One might think that the rule can be modified somewhat so as to delete an h just in case it is in presonorant position. This would account for its deletion in (11) and (12) in the relevant cases and for its failure to delete in forms such as miht 'might', niht 'night', etc. However, it would also predict deletion of h incorrectly in initial position: i.e. *abban ⟵ habban 'to have'.

4. The derivation in (11) above differs from most traditional accounts (cf. Campbell 1959, § 574) in failing to show a macron over the stressed vowel in the case where h is deleted, such lengthening being thought

to be of a compensatory nature. However, Campbell (1959, § 240, fn. 1) notes that in words of the mearh type the only evidence for lengthening is metrical evidence. He further notes that place-name evidence points to exactly the opposite conclusion with respect to lengthening; i.e. placenames like Wăla as genitive plural of Wealh and hăle as dative singular of healh seem to indicate that no lengthening has taken place.

In terms of the metrical theory which appears, for example, in Halle and Keyser (1971) and considerably revised in Halle and Keyser (forthcoming) there is no reason to suppose that vowel length plays a role in OE prosody. As a consequence the alleged lengthening in the oblique cases of mearh is on very shaky ground and shall be ignored in what follows. Rather it shall simply be noted that the conflict between the metrical and placename evidence in words of this type disappears if one assumes that no lengthening has taken place after all and if one adopts a metrical theory of OE verse in which length is not metrically significant.

5. The form sc̄ōna is not attested. However, it is included in the traditional handbooks because of the forms feona from feoh 'money' and þēona from þēoh 'thigh', which are recorded. Note that the length is underlying in sc̄ōna and not due to loss of h.

6. Because of certain special properties of the Class VII contracted verbs, we shall delay discussion of them until later (cf. pp 155 ff below).

7. The reference to wrēoh + an as a 'somewhat more abstract stage' presupposes an even more abstract level of representation without a stem diphthong ēo, but rather a monophthongal vowel; namely, Ī. Thus, parallel to rīdan 'ride', a typical Class I Strong Verb, one would want to postulate wrīh + an. To arrive at the stage wrēoh + an, where the narrative is picked up in the text, it is necessary to assume rules which both dipthongize and lower. These rules are well-known in the traditional handbooks. For example, diphthongization is referred to under the broad rubric of breaking. In this discussion we shall not attempt to push forms back to what appears to be the most abstract representation but rather shall choose that level of abstractness which is important for the argument. Thus, rules of breaking and lowering will be assumed but not formalized.

8. The lengthening which appears in the traditional handbook representations of sēon in all forms which undergo h-deletion has been ignored in (19). (For discussion see fn. 4 above.) The length indications which do appear in (19); for example, sēo, are assumed to result from a very general rule of English phonology which lengthens all word final stressed vowels. This rule, operative in modern English, is assumed to have operated in OE as well and to be responsible for sēo with a long vowel. h-deletion is not the cause of this lengthening.

Notice finally that seon, belonging to Class V Strong Verbs, contains an underlying lax vowel nucleus. That is, it is parallel to metan 'meet'. At its most abstract representation it appears as seh + an. In the text we pick up its representation after breaking has applied; namely, as seoh + an.

9. The loss of -u in bōk + u , nom./acc. sg. and the loss of -i in bōk + i , dat. sg. and nom./acc. pl., is the same phenomenon as that of the loss of -u in a-nouns like word (cf. fn. 2 above). That is, a final vowel drops after a strong syllable but not after a weak syllable. Thus, beside bōc there is studu and beside bēč there is styde. Here too it is possible to reformulate the dropping rule to take into account a weak rather than a strong syllable. However, this discussion is peripheral to our argument and will be left to a later study.

10. See fn. 2 and fn. 9 above for some discussion of this rule.

11. According to Campbell (1959, §§ 624, 627) beside gēs and bēč in the genitive singular, there are recorded forms without either mutation or palatalization; namely, gōse and bōce. Obviously dialects which exhibit these forms require some special treatment. There are several possible tacks that one might take, but without sufficient data about the specific dialects involved, it seems fruitless to speculate at this point. These variants will therefore be noted without further discussion.

12. The deletion rule just specified introduces a variable X into its environment. This variable has the consequence that the deletion rule in OE is actually a rule schema. Properties of rules like this are extremely interesting. In particular, they raise the question of whether or not sequences subsumed under the X variable are disjunctively ordered or not. The application of the deletion rule in OE appears to be quite straightforward and throws no light on these very interesting questions. For a discussion of these properties in much greater and insightful detail see Halle and Vergnaud (forthcoming).

13. It is conceivable that what is treated in the text as gemination is actually degemination; that is, that fremman is underlyingly geminated and that OE has a rule which simplifies geminate consonants in certain environments; for example, fremest, 2nd pers. sg. pres. ind. If this were the case, then one would never find geminate consonants in the degeminating environments. However, this is not the case. There are certain weak verbs of Class I which exhibit geminate consonants throughout the paradigm; e.g. þryčč̆an 'oppress'. The 3rd pers. sg. form is þryčč̆eþ and the past participle is (ge)þryčč̆ed. These forms are readily accounted for if one supposes that this particular verb is underlyingly geminate and that OE contains a rule of gemination to account for the alternations such as fremman beside fremest. The complementary solution which supposed OE to possess a rule of degemination would require that forms like þryčč̆an be marked as exceptions.

14. The endings of lufian which appear in (58) are characteristic of the Mercian dialect of OE as represented, for example, in the manuscript known as the Vespasian Psalter. They are taken as basic in the discussion which follows. However, they differ in two ways from the West Saxon dialect of OE. First, in the latter the 1st pers. sg. pres. ind. form is lufiğe. This represents a West Saxon -e ending beside a Vespasian Psalter -u in this form. The second important difference is that whereas the Mercian dialect shows the vowel -a- in both the present and past tenses, the West Saxon dialect parallels the Mercian only in the present tense. In the past tense where Mercian has -a-, for

example lufade, lufaden, lufad, etc. the West Saxon dialect has lufode, lufoden, lufod. These differences can be accounted for if one assumes an underlying -ā- in both dialects with a West Saxon rule that rounds ā to ō in front of a noncontinuant consonant. Other alternatives also exist. In any event in this paper the Mercian forms are taken as basic.

For discussion of these variants see, e.g., Campbell (1959, §§ 756 -7) and references there.

15. There are certain forms which, superficially at least, suggest that the restriction of metathesis to nonhigh back vowels is necessary. In particular, forms like būan 'dwell' seem to point in this direction. On the other hand, contracted verbs such as þȳn 'press' and tȳn 'instruct' indicate that metathesis of sequences like ȳ + a to ā + ȳ also occur. It is possible to extend the metathesis rule to apply, as a minor rule, to such sequences. Indeed, all instances of high vowels metathesizing that have come to the surface appear to be instances involving ȳ. The number of forms such as those cited above are quite small, however. Thus, we shall leave the precise mechanism to deal with these forms unstated. (Note, by the way, that the assumption of an underlying -w- in būw + an, which never appears orthographically, would automatically block metathesis in this form.)

16. Mutation of the stem vowel in the 2nd and 3rd pers. sg. pres. ind. forms is apparently due to a following -i- vowel which obligatorily deletes in the strong verbs; i.e. fōh + ist, fōh + iþ becoming fēh + ist and fēh + iþ, respectively. Because h remains in these forms the rule which deletes the -i- of the ending must be ordered before h-deletion or else the stem final -h-, occurring intervocalically, will delete. For a detailed discussion of the above phenomena and their interaction with the present system of rules, see Siegel (ms.).

17. Notice that the rule which deletes the nasal consonant in these forms must apply before h-deletion, since, otherwise, the latter rule would delete an intersonorant -h- and prevent (82) from applying.

18. A case of stress placement in Spanish with parallels remarkably close to the case discussed here is presented in Harris (1973). Five Spanish nouns differ in the stress they exhibit from the normal stress assignment pattern in that two rules which normally apply in one order, apply in these five cases in the opposite order. There is apparently nothing to set these five nouns apart from the rest of the lexicon and that seems to be precisely the case with respect to habban and libban in OE. While this parallel between Spanish and Old English is striking, it is difficult at this point to know what to make of it. In particular, it is hard to see how this reverse order should best be represented theoretically.

19. There are two other verbs which regularly appear in the handbooks alongside libban and habban which belong to Class III Weak Verbs. These verbs are sęċġan 'say' and hyċġan 'think'. These verbs exhibit not only metathesis but the processes of i-mutation and palatalization as well. However, they also exhibit a wide variety of dialectal forms and since attempts to account for the various dialects do not appear to bring to light factors beyond those discussed for libban and habban no specific analysis of these forms will be presented here. Rather it

will simply be noted that rule reordering appears to play a part in these two verbs as well. In particular, in strings structured like the infinitive and the 1st pers. sg. pres. ind., i.e. in strings in which the stem final vowel is followed by at least two vowels, the ordering of metathesis before i-mutation and the latter before gemination will produce the correct forms. In strings in which the stem is followed by less than two vowels, the normal rule ordering will suffice.

As was noted in the preceding footnote, the theoretical significance of this is not addressed in this paper.

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