

STUDIES IN LINGUISTICS:  
OCCASIONAL PAPERS

4

ROBERT P. STOCKWELL AND C. WESTBROOK BARRITT

SOME OLD ENGLISH GRAPHEMIC-PHONEMIC  
CORRESPONDENCES--ae, ea, AND a

PRINTED BY BATTENBURG PRESS, NORMAN, OKLAHOMA

FOR

STUDIES IN LINGUISTICS

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(Minor subdivisions of 1 and 2 are not listed here.)

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University of Virginia  
November 1, 1951

Robert P. Stockwell  
C. Westbrook Barritt

## SOME OLD ENGLISH GRAPHEMIC -- PHONEMIC

### CORRESPONDENCES--*æ*, *ea*, and *a*

0. Introduction. The Old English period with which this investigation deals is that which shows the language (including all dialects) in a state of clear departure from its continental roots, but before later OE changes had operated to begin the differentiation of OE from Middle English. Roughly, therefore, the period extends from A.D. 700 to 900.

0.1. Problem. The problem undertaken in this paper<sup>1</sup> is to examine the items from Old English sources in which the spellings *æ*, *ea*, and *a* occur (along with any other spellings which appear in dialectal, allographic, or overlapping relationship with these spellings) to determine their distribution graphemically, and from that distribution to infer the phonemic entities which stand back of the graphemes.

0.2. Presentation. From the statement of the problem it is clear that we are examining only the forms with 'short' vocalic nuclei, including those items spelled with *æ*, *ea*, and *a* over which a macron was not written in the manuscripts and which are for etymological reasons considered not to have contained a 'long' vowel. 'Long' forms include those items over which a macron could be written in the manuscripts and which are for etymological reasons considered to have contained a 'long' vowel. These are *á*, *éa*, and *á*. We are not examining these 'long' forms here, since they appear to be a different problem. We intend to examine them separately in another of several proposed articles on OE phonology. The present paper falls into two parts: 1, statement of our hypothesis and its relation to the tradition; 2, detailed evidence, in two subdivisions--positive evidence and negative evidence.

1. The hypothesis and the tradition.

1.1. Traditional interpretation. Since the traditional interpretation of *æ*, *ea*, and *a* is well known, we summarize it here only briefly. By all authorities who attempt to state the relation of spellings in OE to the sounds which stand behind them, the three spellings are assumed to represent three different sound entities. In the older books<sup>2</sup> this assumption is tacit but unquestioned, since each of the spellings is traced through its own paths of development. If *æ* happens to cross the path of *ea*, the crossing is noted but there is no suggestion that they are not 'different'. In the later books<sup>3</sup> the assumption is clear either for the same reason as in the older works, or from the fact that phonetic interpretations for the spellings are given in such a way as to keep *æ*, *ea*, and *a* apart from each other. *Æ* regularly comes out as something like [æ̃], *ea* as [æ̃ə] or [æ̃a], and *a* as [ɑ] or [ɒ]. These are rough phonetic writings, of course, and no one has interpreted them phonemically as 'sames' or 'different'. Nevertheless, since they are kept carefully apart, it must be assumed that three separate phonemic entities were being described by the authorities.

1.2. Faults of the traditional interpretation. It is assumed in grammars, dictionaries, and articles on OE phonology that there was a structure point in OE which may be called 'length'. Since length is used to set up minimal distinctions, it must further be assumed that it is a phoneme, or that there are 'long' vowel phonemes as well as 'short' vowel phonemes. Thus there are at least four types of vocalic nuclei in OE if the system with length is correct. With symbols, they may be summarized quickly. Our symbols are:

- C = Zero to 'n' number of consonants.
- S = semivowel, i. e., front, back, central, or lengthening off-glide (in complementary distribution with a phoneme elsewhere in the system).
- L = length, as a separate phoneme.

The four types of vocalic nuclei, with an example of each, are:

CVC	<i>nama</i>	'name'
CVLC	<i>nám</i>	'took' (pt. <i>niman</i> )
CVSC	<i>nearu</i>	'narrow'
CVLSC	<i>néar</i>	'near'

The pattern appears neatly symmetrical. It will certainly account for all possible OE contrasts. Indeed, it accounts for a greater number of contrasts than may, in point of fact, exist. We think it is an accurate statement that no languages have been found that utilize more than three of these four theoretically possible distinctions, or of any other four that might be set up; i.e., three types of syllabic nuclei seem to be a generalizable maximum. On the *a priori* grounds that OE was a real language and ought to act like one, the set of four distinctions is objectionable. The modern American English dialects of the writers have but two: V and VS. We know of some speakers who appear to have, in rare sets, three: V, VS, and VLS; but we know of none with four. Of the languages that we have any acquaintance with, none shows more than three of any type of distinctions in syllabic nuclei. We know too few languages to argue that a set of four types is impossible; we would, however, argue that it is bad descriptive practice to set up more types of distinction than may be necessary to account for the observable contrasts, and that this activity appears to have been carried on by earlier analysts of OE.<sup>4</sup>

1.21. The traditional view of OE phonology is hard to accept, then, because, when stated in structural terms, it results in a complex set of vocalic distinctions which we will show are more than is necessary to account for the number of distinctions indicated within the orthography. We do not intend here to describe the phonological structure in anything like its entirety, but we propose at least to show how *ea*, *æ*, and *a* may be accounted for within a system that includes only the vocalic distinctions symbolized

by V and VS. Since this is a critical point at which an analysis without a phoneme of length may stand or fall, it is examined here as the first step in analyzing a simple V ~ VS system. Our assumption is simply that an analysis of OE which can show the same kind of structure points as are observed in Mod.E.<sup>5</sup> is preferable to one which shows a different kind. As a corollary, it follows that an analysis which shows different kinds of structure points in OE and Mod.E. is obligated to demonstrate how such change of basic components could have occurred. (None of the grammars do this.) An analysis which shows the same kind is under no such obligation, since only the details of structure, but not the basic components, are then seen to change. We recognize, of course, that the whole system of intersecting categories which make up a phonemic system CAN, and sometimes DOES, get upset, changing the entire structuring system of the language. But we do not think OE and Mod.E. show differences of that magnitude. Before accepting the hypothesis that they do, it is at least obligatory for analysts to examine systematically several simpler hypotheses such as the one we are here undertaking to test.

1.22. Examine what results if one attempts to keep *æ* and *ea* apart after a postulatory reinterpretation of length as an OE structure point. If he keeps them phonemically distinct, *æ* will be /æ/, and *ea* will be /æ/ plus a central off-glide. The off-glide is indicated phonetically as [ə̣] or [ə̤] or something of the sort (ə̣ means off-glide or on-glide, non-syllabic). Suppose we interpret the off-glide as a phonemic central off-glide /h/, as in Mod.E., though what particular phoneme it belongs with is of no importance to the argument of this paper. It then follows that if they are kept apart, *æ* must represent a simple nucleus and *ea* a complex one. As soon as this stage of analysis is reached, one must ask what *éa* is. The only answer, since the slot of /æ/ plus central off-glide is already occupied by *ea*, is /æ:/ plus the same off-glide. One then has /æ:/, /æh/, and /æ:h/, as well as /æ:/ represented by *æé*, and is right back where he started from in the grammars. For the reasons already stated, a separate phoneme of length may not be acceptable. If a new analysis of *ea* and *æ* which agrees just as well with the graphemic



evidence can be established, it may result in a better, because simpler and more symmetrical, phonemic analysis, and the introduction of a phoneme of length will no longer be necessary at this point in OE structure.<sup>6</sup>

1.3. The hypothesis. The graphs *æ* and *ea* never stand in contrastive distribution with each other within any one OE dialect at any given time. They are allographs of a single grapheme<sup>7</sup> and represent allophones of a single phoneme. Using broken brackets to enclose a grapheme, an arrow to mean 'represent(s)', and slant lines to enclose a phoneme, the hypothesis may be symbolized thus:

$$æ, ea = \langle \text{æ} \rangle \longrightarrow / \text{æ} /$$

The graph *a*, which is the unique allograph of the grapheme  $\langle a \rangle$ , is in contrastive distribution with  $\langle \text{æ} \rangle$  and therefore represents a different phoneme, written by us with the symbol /a/ but assumed to be a low back rounded vowel, say [ɔ]. Its exact phonetic quality is of no importance in this frame so long as it is phonemically distinct from /æ/.<sup>8</sup> In a composite picture of OE as a language made up of several dialects,  $\langle a \rangle$  and  $\langle \text{æ} \rangle$  are overlapping graphemes. That is, among two or more dialects they may both appear as the spelling for a single item, and as a result of this dialectal variation, they may also, though far less frequently, appear in isolated instances of overlapping within a single dialect because of graphic confusion or genuine dialect mixture. Using  $\neq$  to mean 'is in contrastive distribution with' and  $\neq$  to mean 'overlaps (dialectally) with' or 'corresponds dialectally to', the relationships may be symbolized<sup>9</sup> thus:

$$\begin{array}{l} \text{æ, ea} = \langle \text{æ} \rangle \longrightarrow / \text{æ} / \\ \neq \quad \neq \quad \neq \\ \text{a} = \langle \text{a} \rangle \longrightarrow / \text{a} / \end{array}$$

## 2. Detailed evidence.

2.1. Positive evidence. By 'positive' we mean evidence thought to support this hypothesis.

2.11. Derivational. *Æ* and *ea* fall together in Middle English, resulting in /æ/ in Modern English, when secondary developments do not intervene. When secondary influences operate, they operate to affect *æ* and *ea* in identical ways when all other conditions are identical. While *a* also becomes Mod.E. /æ/, it is impossible to include *a* as a member of the OE grapheme <æ> (see fn. 7 for details). The fact that *æ* and *ea* do later fall together leads us to examine spellings in which *æ* and *ea* are found to see if it is possible that they have at all times been phonemically identical. Before examining these spellings, it should be stated that both graphs develop normally into simple vocalic nuclei in Mod.E. unless later developments such as lengthening<sup>10</sup> in open syllables or before lengthening clusters obscure this development, and that further, when such lengthening influences operate, they operate to affect *æ* and *ea* in identical ways. It therefore appears clear that there is nothing in the later development of *æ* and *ea* items which will set them up as phonemic differents, and that they can be called monophthongs with greater certainty in view of the derivational evidence than any interpretation which would make either or both a complex nucleus (diphthong), since in the latter instance an additional hypothesis would be necessary to explain what would then appear later as loss of complexity in the syllabic nucleus.

2.12. Graphic distribution. Two symbols may be stated to be members of one grapheme if they are in complementary distribution or in free variation with each other (free variation need not be a 50-50 alternation), or both. These conditions may be summarized as non-contrastive distribution.

2.121. For West Saxon at any date within the range of this discussion and for other dialects at earlier dates, before secondary influences operated, the over-all basis on which the distribution of *æ* and *ea* is statistically predictable is this:

*ea* is found (but not to the complete exclusion of *æ* as a free variant)..

- A. before *l* or *r* plus consonant (whether homorganic voiced, and therefore later a lengthening cluster, or not);
- B. before *h* alone or plus consonant;
- C. before *l* or *r* followed by a back vowel;<sup>11</sup>
- D. after a preceding palatal in West Saxon and less frequently, in the other dialects.<sup>11</sup>

*æ* is found (but not to the complete exclusion of *ea* as a free variant)

- E. in all other environments.

This complementary distribution is symbolized below, using ABCDE to represent the environments just described, a slash to mean 'or', *c* to mean 'any consonant which happens to occur in this position', *c'* to mean 'any palatal consonant', parentheses to mean 'what is contained may be present or absent', sigma to mean 'the totality of possible environments', *u* to mean 'any back vowel (in actual fact usually *u* or *o*)', *~* to mean 'alternating with', *≈* to mean 'is in complementary distribution with', *≡* to mean 'is in free variation with', *-* to mean 'minus', and *±* to mean 'plus or minus'.

$ea \approx \text{æ}$  in ABC and E:  $ea/c/rc/h(c)/cu \approx \text{æ}\Sigma-lc/rc/h(c)/cu$

$ea \sim \text{æ}$ in D and E:	<p style="margin: 0;"><math>WS \dot{c}ea \approx c\text{æ} - \dot{c}\text{æ}</math></p> <p style="margin: 0;"><math>NWS \dot{c}ea \equiv \dot{c}\text{æ}</math></p>	See 2.123
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Another way of symbolizing the same facts is this:

$$eaABCD \approx \text{æ}\Sigma - ABCD$$

or

$$eaABCD \approx \text{æ}E$$

It must be understood that the above distribution is the statistically predictable or probable one if known and stable secondary influences (such as smoothing, velarization, palatal umlaut) have not operated, but even so it is not an invariable rule. Examples will be given under negative evidence which show clearly that within either environment both *ea* and *æ* may occur in free variation. This is exactly what is to be expected, since one can feel confident that the scribes did not spell allophonic variation with the same consistency that they spelled phonemic differences. In items where complementary distribution cannot be shown, non-contrastive distribution still holds by virtue of the free variation of *ea* and *æ* within those items.

2.122. Since the graphic distribution is non-contrastive, suggesting an allophonic variation of some sort, it is necessary to state what we believe the phonetic basis of the variation to have been. The difference between environments ABC and environment E gives the clue. Tentatively, we suggest that /l/ and /r/ before consonant were strongly resonant, approaching syllabic quality. Furthermore, /l/ and /r/ before consonant, and /x/ everywhere, were back consonants, requiring a retraction and lowering of the tongue. Below we will indicate these phonetic characteristics by the symbols [l̠], [r̠], [x̠]. These consonants had some noticeable, but non-phonemic, effect on the vowel /æ/, perhaps [æ̠], perhaps only [æ̠]. For corroborative evidence regarding the effect of these consonants on the preceding vowel, see Joos §5.11. Since [æ] is well into the low front corner of a vowel triangle, only [Æ] being lower, the darker color which we believe

one allophone to have had can be stated best in terms of backing rather than lowering. The evidence of umlaut, detailed under 2.216, indicates that the essential feature of the darker allophone is backing rather than lowering. In phonetic notation hereafter the allophone represented by *ea* is written simply [æ̯], and it is referred to as the 'back' allophone of /æ/, as compared with the 'front' allophone represented by *æ*, written [æ], but we would not object to inclusion of the additional feature of lowering in this back allophone. Since the difference produced in the vowel was allophonic, one need not expect it to be spelled with complete consistency, but only with what may be described as statistically indicative consistency (which we have shown to be the case). The phonetic quality may be suggested in this way:

<i>eard</i>	/ærd/	[æ̯rd]	'native place'
<i>searu</i>	/særu/	[sæ̯ru]	'skill'
<i>fealdan</i>	/fældan/	[fæ̯ldan]	'to fold'
<i>eaht</i>	/æxt/	[æ̯xt]	'assembly, council'

as compared with

<i>æt</i>	/æt/	[æt]	'at'
<i>fæst</i>	/fæst/	[fæst]	'fast'
<i>ræt</i>	/ræt/	[ræt]	'rat'
<i>sæl</i>	/sæ̯l/	[sæ̯l] <sup>12</sup>	'room, hall'

All these 'short' forms are still clearly in phonemic opposition with the 'long' forms, such as *ǣ* and *éa*, which we assume to have been /æ/ plus some sort of phonemic off-glide, possibly resulting in a complex like /æh/.

Thus /æ/ appears to have consisted of two allophones, a front and a back, [æ] and [æ<sup>>] with or without lowering in the back allophone, written *æ* and *ea*, with the latter spelling also indicating that the scribe heard the resonant quality and dark color of the following consonant which combined with the back quality of the allophone to cause him to write it in this moderately consistent manner of differentiation. [æ<sup>>], the allophone of /æ/ which occurs before /lc/,<sup>13</sup> /rc/, /x(c)/, /lu/ and /ru/, in WS and other dialects before later influences have operated, is in strict complementary distribution with [æ] elsewhere, regardless of whether [æ<sup>>] happens in a given instance to be spelled *ea* (the more frequent) or *æ*; and, likewise, whether the [æ] happens to be spelled *æ* (the more frequent) or *ea*. Further developments within the dialects (smoothing, palatal umlaut, *etc.*) create differences in the distribution between dialects, but in each dialect the distribution remains non-contrastive. For graphemic reasons which will be stated in proper sequence, we do not believe that the *æ* ~ *ea* in the environment of D alone represents any allophonic variation, with [æ] being the only allophone represented by either spelling. Section 2.123 examines this matter in detail.

2.1221. Our phonetic interpretation needs further amplification at two points: (1) if *ea* represented a simple nucleus, why was it written with two graphs? and (2) what is the phonetic difference between the back allophone of /æ/ with its following back and resonant consonant and /æ/ plus phonemic central off-glide in similar environments?

The writing of the back allophones with two graphic segments appears problematical in the extreme, at least within the present frame. Graphic habits are difficult to account for at best, and we certainly do not fully know the answer here. Among the OE consonantal graphs, there are parallels, such as *sc* for /š/ and *cg* for /ĵ/ (unless one could seriously maintain that *cg* was /dž/, which we doubt). Obviously the chief evidence which has caused the

interpretation of *ea* as a diphthong in the past is the fact that, whatever it represented, it was spelled with two segments. Since it was thought to be a 'breaking' of *æ*, the interpretation of it as two phonetic segments seemed credible-- and indeed, it is credible until its effect on the larger scheme of the phonology is considered. But when this larger scheme is examined within a frame of only two probable types of vocalic opposition (V and VS), and when the clear non-contrastive distribution between *æ* and *ea* is shown, it seems to be an inevitable conclusion that *ea* shows but one phonemic segment. One must then further conclude that the *ea* spelling shows some non-significant allophonic variation, perhaps of approximately the type that we have indicated, perhaps of somewhat different phonetic shape, but at all events not completely ascertainable beyond the very important recognition that *ea* and *æ* are members of a single phoneme /*æ*/.

2.1222. /*æ*/ plus phonemic off-glide /h/ (or in whatever phonemic slot it may turn out to be necessary to write this central off-glide) can be phonetically indicated by a formularization such as [*æ*h]. This is *éa*, possibly also *ǣ* (we do not wish to commit ourselves beyond the statement that at least one of them was /*æ*/ plus central off-glide). The off-glide is A PART OF THE SYLLABIC NUCLEUS. In the case of the back allophone of /*æ*/, which was *ea*, the off-glide which may be assumed to have produced the two-segment writing was A PART OF THE ARTICULATION OF THE FOLLOWING CONSONANT. Because this articulation was more distinct in situations where the environment was /l/ plus consonant and /r/ plus consonant, the spelling was most consistent here. Elsewhere it was sometimes heard and recorded, sometimes not. Before *h* /x/, the back quality of the consonant was heard and interpreted in the same way that the back resonant quality of /lc/ and /rc/ was. But note that later developments before /x/ and before /l/ or /r/ followed by *c*, *g*, or *h* are different from those in other environments. This difference, which we examine in detail under the name of 'smoothing' (2.125), presumably resulted at a later date when the 'palatal' articulation of /x/, /č/, and /y/ came

to be the operative phonetic influence rather than the back articulation of /x/, /l/, and /r/.

2.123. The results of the phenomenon called diphthonging after a preceding palatal, environment D under 2.121, cannot be considered as analogous to the results which we have been examining in the ABC ~ E situation. There is no phonetic basis for assuming that  $\text{æ}$  and  $\text{ea}$  were here different allophonically (and certainly they were not different phonemically). The distribution in all dialects where  $\text{cea-}$  and  $\text{gea-}$  occur is that  $\text{ea}$  is spelled after  $\text{c}$  and  $\text{g}$ , when they represent palatal consonants, but  $\text{æ}$  is spelled when they represent back consonants. In the dialect distribution,  $\text{æ}$  is found after all consonants, palatal or non-palatal, with increasing frequency as the dialect is located further to the north. In the most northern dialects  $\text{æ}$  is the only spelling for the phoneme / $\text{æ}$ / after palatals. WS is the only dialect which shows clear complementary distribution between  $\text{ea}$  and  $\text{æ}$  after  $\text{c}$ ,  $\text{g}$ , and  $\text{sc}$ . The situation here is as stated by the formula  $\text{c}ea \approx \text{c}\text{æ} - \text{c}\text{æ}$ . In the Anglian dialects, where the distribution is not completely complementary,  $\text{ea}$  and  $\text{æ}$  are free variants after  $\text{c}$ ,  $\text{g}$ , and  $\text{sc}$  ( $\text{ea}$  more frequent in SW Mercian,  $\text{æ}$  elsewhere). Thus the formula  $\text{c}ea = \text{c}\text{æ}$ . In Kent,  $\text{ea}$ ,  $\text{æ}$ , and  $\text{e}$  all occur after the palatals, but no phonemic problem exists since only  $\text{ea}$  represents an / $\text{æ}$ / phoneme.<sup>14</sup>

Before making a phonetic interpretation, one further graphic fact should be pointed out. There are numerous instances after  $\text{c}$ ,  $\text{g}$ , and  $\text{sc}$  of  $\text{e}$  being written before vowel graphemes besides  $\text{a}$ , in such a fashion as to produce permitted graphic vocalic clusters, merely to indicate the palatal quality of the consonant. Thus  $\text{fisceas}$  'fish',  $\text{sceóp}$  'created',  $\text{sceolon}$  'shall',  $\text{geong}$  'young' (for /u/).

This evidence makes sense phonetically on the assumption that only the front allophone of the / $\text{æ}$ / phoneme was represented in all situations where the preceding palatal alone is considered to have been the 'diphthonging'



force. In items like *scearp*, *ceald*, where ABC environments combine with D, [æ̯] must be assumed. A list will clarify our view, omitting Kentish, where the back allophone [æ̯] presumably was the only allophone of /æ/ (see dialect chart, 2.124). The forms given for Anglian are the statistically predictable ones.

WS		Anglian
<i>ceaster</i> 'city'	→ /čæster/	[čæster] ← <i>cæster</i> 'city'
<i>geat</i> 'gate'	→ /yæt/	[yæt] ← <i>gæt</i> 'gate'
<i>sceaft</i> 'staff'	→ /šæft/	[šæft] ← <i>sceaft</i> 'staff'
<i>cæfl</i> 'halter'	→ /kæfol/	[kæv̥l̥] ← <i>cæfl</i> 'halter'
<i>ceafl</i> 'jaw'	→ /čæfol/	[čæv̥l̥] ← <i>caefl</i> 'jaw'
<i>ceald</i> 'cold'	→ /čæld/	[čæ̯ld] ← A secondary change, velarization, has operated in Anglian to obscure the correspondence here. See the dialect correspondences given in 2.124

How do we explain the fact that the *ea* after palatal is more frequent in WS than in the other dialects? First, we point out that the distribution of *ea* ~ *æ* after palatals is not quite so neat as the handbooks<sup>15</sup> suggest. *ea* simply DOES occur with sufficient frequency after palatals in the NWS dialects to require that this fact be considered as quite normal in all dialects. Here are some typical examples from a few chapters of the Lindisfarne (NH) Matthew text:

<i>geatt</i>	'gate'	16.18		
<i>forgeaf</i>	'forgave'	18.8	18.27	18.32
<i>ceastre</i>	'city'	21.18		
<i>gegeadrade</i>	'joined'	19.6		

Second, we believe that purely graphic characteristics can be as much dialectal as can phonemic characteristics. For example, the use of *i* or *y* after any vowel in Northern ME to represent any 'long' vowel. Thus Southern or Midlands ME *name*, *naam*, but Northern *naime-*, *nayme*. It is therefore our assumption that the WS scribes had a tradition in which *e* was written to indicate that a preceding *c*, *g*, or *sc* was palatal. Ideally, they should have written something like *geæt* or *geaet* for *geat*, but they did not for two good reasons: graphic triphthongs were not permitted except very early in the OE scribal tradition; and they already had a perfectly satisfactory way of spelling the phoneme /æ/ which included an *e* in the right position, namely *ea*. The scribes of the other dialects did not happen to develop this same tradition so clearly.

See 2.125 for discussion of the *ie* diphthong after the palatal.

2.124. We have stated the derivational evidence, the statistically indicative graphic evidence, our interpretation of this evidence in phonetic and phonemic terms, and the special interpretation of the evidence introduced by diphthonging after palatals. There remains one large body of positive evidence to be presented. This is the graphic correspondence between dialects which bears out our hypothesis by the consistency with which secondary developments fail to set up oppositions in the pattern which underlies all the dialects. The chart which follows presents this evidence by showing the correspondences between dialects in four forms: (1) formulaic spelling; (2) phonemic and phonetic interpretation of the vocalic nucleus

of items with / $\text{æ}$ /, so that the front or back allophone is clearly indicated within its controlling environment (see 1.3 for statement about phonetic quality of / $\text{a}$ /); (3) a listing of the traditional name for the primary or secondary sound law which last operated to produce the forms cited; and (4) examples in each category from each dialect. The symbols used in the formulaic spellings are those already used earlier.

WS	Mercian	NH	Kent
ealc / $\text{æ}$ /[ $\text{æ}^>$ ] breaking <i>healdan</i> <i>healf</i>	alc / $\text{a}$ / velarization <i>haldan</i> <i>half</i>	alc / $\text{a}$ / velarization <i>haldan</i> <i>half</i>	ealc / $\text{æ}$ /[ $\text{æ}^>$ ] breaking <i>healdan</i> <i>healf</i>
earċ/h / $\text{æ}$ /[ $\text{æ}^>$ ] breaking  <i>mearc</i> <i>earc(e)</i> <i>earh</i>	ærċ/h / $\text{æ}$ /[ $\text{æ}$ ] smoothing  <i>mærc</i> <i>ærc(e)</i> <i>ærh</i>	ærċ/h ~ arcċ/h / $\text{æ}$ / [ $\text{æ}$ ] / $\text{a}$ / smoothing; northern ve- larization  <i>mærc, marc</i> <i>ærc(e)</i> <i>ærh</i>	earċ/h / $\text{æ}$ /[ $\text{æ}^>$ ] breaking  <i>mearc</i> <i>earc(e)</i> <i>earh</i>
earc-ċ/h / $\text{æ}$ /[ $\text{æ}^>$ ] breaking  <i>earm</i> <i>eard</i>	earc-ċ/h / $\text{æ}$ /[ $\text{æ}^>$ ] breaking, no smoothing  <i>earm</i> <i>eard</i>	earc-ċ/h / $\text{æ}$ /[ $\text{æ}^>$ ] arc-ċ/h / $\text{a}$ / breaking, no smoothing; northern ve- larization  <i>earm, arm</i> <i>eard</i>	earc-ċ/h / $\text{æ}$ /[ $\text{æ}^>$ ] breaking  <i>earm</i> <i>eard</i>
eah(c) / $\text{æ}$ /[ $\text{æ}^>$ ] breaking <i>feah</i>	æh(c) / $\text{æ}$ /[ $\text{æ}$ ] smoothing <i>fæht</i>	æh(c) / $\text{æ}$ /[ $\text{æ}$ ] smoothing <i>fæht</i>	eah(c) / $\text{æ}$ /[ $\text{æ}^>$ ] breaking <i>feah</i>

æc /æ/ [æ] AF brightening, no breaking	æc /æ/ [æ] AF brightening, no breaking	æc /æ/ [æ] AF brightening, no breaking	ec /e/ Further brightening of [æ] re- sulting in coalescence with /e/ fest let
<i>fæst</i> <i>læt</i>	<i>fæst</i> <i>læt</i>	<i>fæst</i> <i>læt</i>	

ealu /æ/[æ>] back umlaut in this form only, in prose (pro- bably borrowing from Mercian)	ealu /æ/[æ>] back umlaut	alu /ɑ/ no back umlaut of æ	ealu /æ/[æ>] borrowing from Mercian
<i>ealu</i>	<i>ealu,</i>	(?) <i>alu</i>	<i>ealu</i>

acu-alu /ɑ/ Darkening before back vowels	eacu /æ/[æ>] back umlaut	acu /ɑ/ Darkening before back vowels	acu /ɑ/ Darkening before back vowels
<i>hafoc</i> <i>stapol</i>	<i>heafuc</i> <i>steapol</i>	<i>hafoc</i> <i>stapol</i>	<i>hafoc</i> <i>stapol</i>

ac /ɑ/ [At one stage in pre-literary OE <i>a</i> failed to brighten in neighborhood of nasals; then [ɑ] was an allophone of /æ/. Latin borrowings and other influences from without upset the complementary distribution and the phonemic split was complete before our earliest records.]	ac /ɑ/	ac /ɑ/	ac /ɑ/
<i>lacu</i> <i>habban</i> <i>hnappian</i>	<i>lacu</i> <i>habban</i> <i>hnappian</i>	<i>lacu</i> <i>habban</i> <i>hnappian</i>	<i>lacu</i> <i>habban</i> <i>hnappian</i>

ie /i/[i>]  
umlaut of  $ea$ ,  
found therefore  
in identical  
environments as  
 $ea$ . See discus-  
sion below. [WS  
only]

e /e/,  $\text{æ}/\text{æ}/[\text{æ}>]$  e /e/,  $\text{æ}/\text{æ}/[\text{æ}>]$  e /e/

umlaut of  $\text{æ}$ ,  $ea$ ,  
and  $a$

*hieldan*  
*wierman*

*hældan*  
*werman*

*hældan*  
*werman*

*heldan*  
*werman*

e /e/  
umlaut of  $\text{æ}$ ,  
found therefore  
in similar  
environments

e /e/

e /e/

e /e/

umlaut of  $\text{æ}$

*settan*

*settan*

*settan*

*settan*

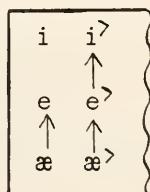
2.125. There are a few pertinent observations to be made. The phenomenon of 'smoothing', in these terms, is not at all a change from diphthong to monophthong, as ordinarily stated, but simply the change from  $[\text{æ}>]$  to  $[\text{æ}]$  (the two allophones of  $/\text{æ}/$ ) before a palatal or palatal cluster. In 2.1222 we noted that the later development of  $/\text{æ}/$  before  $/x/$  and  $/l/$  or  $/r/$  plus  $c, g,$  or  $h$  is divergent from that of  $/\text{æ}/$  before  $/l/$  and  $/r/$  elsewhere. The nature of the later development in the latter environments is taken up briefly in the conclusion, since it is not part of the specific problem under investigation. But the development which may be conveniently called smoothing must be examined in detail to show why it is not, in process, a reversal of the earlier phenomenon of breaking. In result, as indicated above, it is a reversal; i.e.,  $[\text{æ}>]$  has fronted to  $[\text{æ}]$  in these environments. But there is no

harm in this if the development is the result of a different influence at work. The back quality of /x/ and the dark and resonant quality of /l/ and /r/ before consonant, and vowel harmony with following back vowel (in back umlaut and darkening before back vowels [see 2.128-8]) were used to explain the development of the back allophone of /æ/, written *ea*. When this back allophone changed again to the front, written *æ* (and then is further raised to /e/, written *e*), it is not sound method to say simply that the /x/, /č/, and /y/ were then bright consonants and therefore demanded the front and brighter allophone [æ] of the preceding phoneme. We believe this is playing fast and loose with the principles by which sound change operates. Why not assume, as earlier suggested, that /x/, /lč/, and /rč/ were still back, still dark consonants, but that at this later date the 'palatal' quality, by which we mean friction between tongue surface and roof of mouth, of /x/, /č/, and /y/ was the operative influence toward changing the preceding back dark member of the phoneme /æ/ to the front bright member? By such an explanation, so long as the chronology is maintained strictly, there is no contradiction, no *ad hoc* shifting of bright and dark color to suit the need of the moment. Professor Joos has pointed out to the writers that in Mod.E., /k/ and /g/, even in contact with /o/ or /u/ so that the articulation of /k/ and /g/ is velar, will distort the margin of the neighboring vowel towards high front color - a piece of very interesting corroborative evidence. There is another item of chronology which we propose to revise slightly also, and we therefore leave the chronological listing of these changes until this matter has been examined. The later change ordinarily called 'palatal umlaut' or 'palatal mutation' is not loss of *a* in *ea* as described by Wyld (§111), but is simply a further raising of the [æ] to [e] by the influence of the palatal quality of the consonant or cluster, at which time it falls in with /e/ and is no longer a member of the /æ/ phoneme. Thus the series *feahrt* > *fæht* > *feht* (early, middle, and late NH) is phonetically [fæxt] > [fæxt] > [feçt], phonemically /fæxt/, /fæxt/, and /fext/.

2.126. The *ie* umlaut of  $ea$  in WS as compared with  $e$  elsewhere illustrates the process whereby a set of allophones of a single phoneme fall in, under umlaut conditions, with two phonemes in one dialect, but with only one in other dialects.

WS: \*~~sæ~~ttjan \*/sættjan/ > settan /settan/ [ $\text{æ}$ ] > [ $\text{ɛ}$ ] /e/  
 \*feallið \*/fællið/ > fiellð /fiellð/ [ $\text{æ}$ ] > [ $i^>$ ]/i/

As the phonetic interpretations indicate, we assume that the *ie* spelling shows the same kind of allophonic variant of /i/ that  $ea$  shows for / $\text{æ}$ /. Since the graphic distribution is closely similar, with regular allographic variation between *ie*, *i*, and *y*, the assumption would seem to be defensible. This split occurs only in WS; Anglian and Kentish show /e/ urlauts for any member of the / $\text{æ}$ / phoneme. The distribution of contrasts within these sets between dialects is a matter to which we return in examining negative evidence. The fact that WS [ $\text{æ}^>$ ] shows an urlaut in /i/, while [ $\text{æ}$ ] is urlauted to /e/, indicates that the essential feature of the allophone represented by  $ea$  is backing rather than lowering (see 2.122). The umlaut of  $\text{æ}$  to  $e$  is simple raising: [ $\text{æ}$ ] > [ $e$ ]. But when  $ea$  goes to *ie*, a crossing with / $\text{æ}$  > e/ would result if  $ea$  were simply a lower allophone [ $\text{æ}^\vee$ ] instead of [ $\text{æ}^>$ ]. The crossing would result when, by simple raising, [ $\text{æ}^\vee$ ] became [ $\text{æ}$ ], then [ $e$ ], and then went on to [ $i^\vee$ ] while the [ $e$ ]'s which had come from the simple umlaut of [ $\text{æ}$ ] remained unchanged. The process of development to *ie* /i/ must have been raising of a *back* allophone right along the line, so that each new stage of umlaut stays out of the way of the front allophones: [ $\text{æ}^>$ ] > [ $e^>$ ] > [ $i^>$ ]. This way there is no crossing. Thus in a vowel diagram, with only pertinent symbols included, the parallel development is something like this:



The umlaut forms of [æ] and [æ̃] were allophonic until the umlaut of [æ̃] went one notch higher and fell in with /i/ while the umlaut of [æ] stopped at /e/.

2.127. The fact that the umlaut of *ea* from whatever source is *ie*, while the umlaut of *æ* is *e*, presents an interesting apparent contradiction of our hypothesis if the traditional chronology is correct. To illustrate this point, the WS forms *giest* 'guest', *iieldra* 'older', and *scieran* 'shear' are taken as typical examples of the three types of development which all yield an *ie* in WS. The traditional statements of the sources of the *ie*'s are as follows:

- giest*: <WGmc \*gasti  
 >\*ǣsti (AF brightening)  
 >\*ǣsti (palatalization of initial consonant by following front vowel)  
 >\*ǣasti (diphthonging of vowel by preceding palatal)  
 >\*ǣiasti (i-umlaut of *ea*)  
 >\*giest (loss of final unstressed vowel)
- iieldra*: <WGmc \*aldira  
 >\*ældira (AF brightening)  
 >\*ealdira (breaking)  
 >\*iieldira (i-umlaut)  
 >ieldra (loss of unstressed vowel)
- scieran*: <WGmc \*skeran  
 >\*sċeran (palatalization of initial consonant by following front vowel)  
 >scieran (diphthonging of vowel by preceding palatal)

The apparent contradiction is, clearly, in the matter of our interpretation of the *ea* whose source is diphthonging by preceding palatal. If it really represents the front allophone [æ] (see 2.123), why does it not show the same umlaut spelling *e* that is shown everywhere else that the



[ $\alpha$ ] underwent umlaut, as in *settan* (see 2.126)? Why does it show *ie* under umlaut conditions? The answer, we believe, lies in a fault of the Luick (p. 350) chronology, adopted without change by Moore and Knott *et al.* Since Luick and those who followed him assumed that *ea* and  $\alpha$  were separate phonemes, in making out their chronology it was imperative for them to give all sources of *ea* chronological precedence to i-umlaut, in order that they might account for the fact that *ie* appeared everywhere they thought an *ea* had been umlauted. Thus the chronology was neatly arranged:

1. AF brightening.
2. Palatalization of initial consonant by following front vowel.
3. Breaking.
4. Diphthonging by initial palatals.
5. I-umlaut.

This is flawless so long as *ea* and  $\alpha$  are assumed to be two phonemes. If they represent respectively the back and front allophones of a single phoneme in ALL environments where they occur, it is still flawless. But if, as we believe, in environments where a preceding palatal was the only cause<sup>16</sup> of *ea*'s development, *ea* does NOT represent the back allophone, but is rather the front allophone of / $\alpha$ /, then the chronology will not work. If the chronology is right, and if *ea* in the exclusive operative environment of preceding palatal is the front allophone of / $\alpha$ /, then *giest* must appear as \**gest*. It does not, and we therefore suggest on the basis of this evidence that a very small revision of the chronology is in order: the placing of i-umlaut BEFORE diphthonging by initial palatals. The order of the chronology listed above is then revised to this:

1. AF brightening.
2. Palatalization of initial consonant by following front vowel.
3. Breaking.
4. I-umlaut.
5. Diphthonging by initial palatals.

By this scheme, how does *giest* develop? The first three steps are unchanged: \*gasti > \*ǣasti > \*ǣsti. Then i-umlaut occurred, giving \*ġesti. THEN the *e* was 'diphthongized' (see 2.128-7) by the preceding palatal, and the final -i was lost, giving *giest*. The 'diphthonging' of *e* to *ie* by preceding palatal is of course well supported by numerous original *e*'s which, after palatal, received the same treatment, as in *scieran*. It may then be said that in WS, *e* from any source was 'diphthongized' after palatal to *ie*. The developments of *iieldra* and of *scieran* are just as stated, being unmodified by this change in the chronology. The precise nature of this diphthongization is a matter for separate investigation; we do not, as has already been indicated, believe that it was a complex nucleus, but the evidence to give the whole story about the OE /i/ phoneme remains for another paper at least as long as this one.

2.128. Since the chronology of change is of first importance to understanding the distribution of *ǣ*, *ea*, and *a*, and since several traditional terms for these changes have been partially redefined in this paper, a chart of the changes affecting *ǣ*, *ea*, and *a*, their traditional names, and a brief statement of the direction of re-definition may be in order.

1. WGmc *a* > AF *ǣ* (except before nasals).
  - A. 'Anglo-Frisian brightening.'
  - B. 'Brightening' = fronting and probably unrounding, i.e., /a/ > /ǣ/. /ǣ/ is unround low front, and /a/ is low back or central; if back [ɒ], it is also rounded, and hence we add 'probably unrounding' in development to /ǣ/.
2. Primitive OE back consonants *c*, *g*, and *sc* > palatal consonants *ċ* and *ġ* in neighborhood of front vowels and *ċ* everywhere.
  - A. 'Palatalization by front vowels'
  - B. As stated, i.e., /k/, /g/, and /sk/ > /ċ/, /y/, and /š/ in specific environments, giving two allophones which later split and become

separate phonemes. The split has occurred by A.D. 700, as attested by such forms as *geong* 'young'.

3. Pr. OE  $\alpha$  > *ea* before /lc/, /rc/, and /x(c)/.
  - A. 'Breaking'.
  - B. Redefined as development of back allophone of / $\alpha$ /, i.e., / $\alpha$ / splits into [ $\alpha$ ] and [ $\alpha^>$ ].
4. Pr. OE  $\alpha$  > *a* before /cu/ in WS, NH, and Kent, but *ea* before /cu/ in Mercian.
  - A. 'Darkening before back vowel' but 'back umlaut' in Mercian.
  - B. Redefined as product of vowel harmony; back vowel of following syllable requires back allophone of / $\alpha$ / in preceding syllable. The process stops at this point in Mercian, which shows *ea*, but the process is carried on further in WS, NH, and Kent, by being backed all the way to / $\alpha$ / and appearing as that phoneme. Thus there is a dialect split caused simply by the failure of one dialect to carry a sound change as far out as the other dialects. An analogous situation appears in Kent, where the brightening of / $\alpha$ / has gone further than in the other dialects.
5. NH *ea* > *a* before /lc/ and, in more northern area, /rc/; Mercian *ea* > *a* before /lc/ only.
  - A. 'Velarization'.
  - B. Redefined as a further extension of the backing process which started as 'breaking'; i.e., [ $\alpha$ ] > [ $\alpha^>$ ] > [ $\alpha$ ] which then falls in with / $\alpha$ /.
6. Pr. OE  $\alpha$  > *e*, *ea* > *e* or *ie* (depending on dialect) before *i/j* in following syllable.
  - A. 'i/j umlaut'.
  - B. As stated, except that the only *ea* which gives *ie* is that from breaking, which is the back allophone of / $\alpha$ /.

dialects is involved: under umlaut, /æ/ > /e/ from front allophone, > /i/ from back allophone. The process of i-umlaut we assume to have been one of vowel harmony in operation.

7. Pr. OE  $\alpha > ea$ ,  $e > ie$  (WS only) after preceding palatal.
  - A. 'Diphthonging by the preceding palatal'.
  - B. Not diphthonging at all:  $ea$  is [æ] /æ/ in this environment, quite unchanged except for spelling tradition;  $ie$  is /i/ from whatever source, with the exact distribution of allophones remaining a matter for separate investigation.
  
8. Kentish  $\alpha > e$ , and some Mercian  $\alpha > e$ .
  - A. 'Zweite Aufhellung'.
  - B. Further extension of original brightening, resulting in coalescence of  $\alpha$  and  $e$  as /e/.  $ea$ , in Kentish, which had been [æ<] as long as  $\alpha$  remained [æ], became the unique allophone of the /æ/ phoneme in Kent, and its phonetic quality is thereafter uncertain.
  
9.  $ea > \alpha$ ,  $\alpha$  later  $> e$  before palatals or palatal clusters with /l/ and /r/.
  - A. 'Smoothing'.
  - B. As stated, except that the friction quality of the palatals is now considered to be the operative force in the change; the same clusters were among those that earlier caused 'breaking', when the dark back quality of the clusters was the operative force.
  
10.  $ea > \alpha$  or  $e$ , and  $\alpha > e$  before  $h\delta$ ,  $ht$ , and  $hs$ , before front vowel or zero.
  - A. 'Palatal umlaut'.
  - B. Same process as smoothing, but later and more general.

The dates for these ten sound changes extend from the third century clear down to the end of the OE period,

but all either had operated to completion or were beginning to operate by the middle of the eighth century.

2.2. Negative evidence. By 'negative' we mean two things: absence of certain facts in the graphic distribution which if present would constitute contradictory positive evidence; and presence of isolated items which seem to establish contradictions but which under examination are seen to be explainable still within the hypothesis.

2.21. (1) If *ea* and *æ* represent separate phonemes, it SHOULD be possible to find numerous examples, within any single dialect, of paired items which contrast by virtue of the *ea* ~ *æ* distinction alone. (2) It SHOULD be largely impossible to find *ea* and *æ* alternating as the spelling for the syllabic nucleus of specific items. (3) Assuming that *a* represents still a third phoneme, it SHOULD be possible to establish a consistent and predictable set of three contrasts within each dialect where all three spellings occur. None of these conditions are fulfilled.

2.211. Failure of *ea* to contrast frequently with *æ* in any dialect.<sup>17</sup> The following is a partial list of WS *ea* forms for which there is no contrast in *æ*:

<i>earg</i>	'effeminate'	<i>wealh</i>	'Welshman'
<i>healt</i>	'halt'	<i>wealg</i>	'wallow'
<i>scearfian</i>	'scrape'	<i>sealt</i>	'salt'
<i>stearc</i>	'strong'	<i>ceald</i>	'cold'
<i>tealt</i>	'unsteady'	<i>heard</i>	'hard'
<i>healdan</i>	'hold'	<i>sceard</i>	'incision'
<i>scearn</i>	'sharn'	<i>spearnes</i>	'frugality'
<i>beard</i>	'beard'	<i>stearn</i>	'sea-swallow'
<i>beald</i>	'bold'	<i>stealdan</i>	'to possess'
<i>eald</i>	'old'	<i>sweard</i>	'hide'
<i>fealdan</i>	'fold'	<i>ðearl</i>	'vigorous'
<i>gearn</i>	'yarn'	<i>weard</i>	'ward, protection'
<i>sceald</i>	'shallow'		

This list can be extended to include practically all<sup>17</sup> WS words where an /æ/ phoneme is expected before /rc/, /lc/, or /x(c)/. The other side of the coin shows an equally clear face in WS. A partial list of WS æ forms for which there is no contrast<sup>17</sup> in *ea* will demonstrate:

<i>fæst</i>	'firm'	<i>dæftan</i>	'to arrange'
<i>æfter</i>	'after'	<i>fæðm</i>	'embrace'
<i>bæc</i>	'back'	<i>fæder</i>	'father'
<i>ðæc</i>	'thatch'	<i>sæpig</i>	'sappy'
<i>ðæt</i>	'that'	<i>tæfl</i>	'die' 'cube'
<i>wæfre</i>	'unstable'	<i>tæppa</i>	'tap' 'spigot'
<i>wæps</i>	'wasp'	<i>hrædlic</i>	'quick'
<i>gæd</i>	'society, fellowship'	<i>læpewince</i>	'lap-wing'
<i>græft</i>	'graven image'	<i>mæsen</i>	'brazen'
<i>hæpse</i>	'hasp'	<i>næss</i>	'ness'
<i>hættiann</i>	'to scalp'	<i>þæð</i>	'path'
<i>hæt</i>	'hat'	<i>ræfter</i>	'rafter'
<i>sæc</i>	'offensive'		

These two lists, then, illustrate how easy it is to find items spelled *ea* lacking contrast with *æ*, and *æ* lacking contrast with *ea*, in WS. Kentish is eliminated from discussion by having only *ea* for /æ/, and /e/ elsewhere. In the Anglian dialects, it is quite as exceptional to find graphic contrasts between *ea* and *æ* as it is in WS, though for somewhat different reasons. A glance at the dialect chart will show that some WS *ea*'s correspond with *a*, others with *æ*, and still others with *ea*. A new *æ* from umlaut of *a* (which itself is from velarization of /æ/) corresponds with WS *ie*. The distribution remains clearly a bi-partite set of contrasts:  $\text{æ} \neq a$ ,  $\text{ea} \neq a$ , but not  $\text{æ} \neq \text{ea}$ .

2.212. *Ea* alternating with *æ* as the vocalic nucleus of given items — that is, *ea* in graphic free variation with *æ* — is illustrated by such WS items as those in the following partial list:

<i>æhtian</i>	~	<i>eahtian</i>	'to consider'
<i>ræfter</i>	~	<i>reafter</i>	'rafter'
<i>æx</i>	~	<i>eax</i>	'axe'
<i>mærh</i>	~	<i>mearh</i>	'horse'
<i>mærð</i>	~	<i>mearð</i>	'marten'
<i>hærp</i>	~	<i>hearp</i>	'harp'
<i>æhta</i>	~	<i>eahta</i>	'eight'
<i>bærs</i>	~	<i>bears</i>	'perch'

An alternation much more common than this intra-dialectal one, of course, is the inter-dialectal alternation of *æ* and *ea*, where secondary developments like smoothing have caused the higher allophone to be chosen in Anglian, the lower in WS, or in the case of back umlaut, the lower in Anglian and the higher in WS. There is at all times in Anglian or WS sufficient intra-dialectal free variation to show that the scribes were dealing with a pair of allophones that could be graphically confused.

2.213. Within the frame of these three spellings it is impossible to set up more than two contrasts per dialect. Let us take pairs where the vocalic nucleus establishes a minimal contrast.

---

NH, Merc.	<i>hald</i> -an	'hold'	≠	NH, Merc.	<i>hæld</i>	'custody'
WS	<i>heald</i> -an	'hold'	≠	WS	<i>hield</i>	'custody'

---

NH, Merc.	<i>bald</i>	'bold'	≠	NH, Merc.	<i>bæld</i> -an	'to encourage'
WS	<i>beald</i>	'bold'	≠	WS	<i>bield</i> -an	'to encourage'

---

Such pairs may be listed at length. As the dialect chart shows, the contrasts are bi-partite:

WS	<i>ea</i> /æ/ ≠ <i>ie</i> /i/
	<i>æ</i> , <i>ea</i> /æ/ ≠ <i>a</i> /a/
	but
	<i>ea</i> ≈ /≡ <i>æ</i>

	$ea, \text{æ} / \text{æ} / \neq a / \text{a} /$
Anglian	but
	$ea \approx / \equiv \text{æ}$
Kent	$ea / \text{æ} / \neq e, \text{æ} / \text{e} /$

2.214. The failure of graphic distribution to fulfill the conditions one would expect to find if three phonemes were represented by these three symbols is strong negative evidence of the first type in favor of a hypothesis which makes  $\text{æ}$  and  $ea$  representatives of a single phoneme.

2.22. There are isolated items which seem to establish contradictions to the hypothesis. In leaving these until last, we have perhaps emphasized too heavily the over-all statistical consistency of spelling which is the strongest positive argument. If, however, satisfactory statements of explanation can be made about these apparent exceptions, they become a proving ground of some value in the support of the hypothesis.

2.221. *Ælf* - (the first element in personal names): the WS form of this item outside of personal names is *ielf* (*elf*, *ylf*, *ilf*). The Anglian form is *ælf*. The problem involved is this: why did it not occur in WS names as *Ealf*- instead of *Ælf*-? Before *-lf*,  $ea$  is the expected spelling of the  $/\text{æ}/$  phoneme. The Anglian form *ælf* is, like the WS, an umlaut form. Anglian *ælf* is by umlaut of *\*alfi-*, WS *ielf* by umlaut of *\*ealfi-*. It appears that the *ælf*- spelling in WS names is a borrowing from Anglian and that the  $\text{æ}$  spelling of the name form had prestige over a hypothetical *\*ealf* form (which does not exist in any dialect) and is therefore the only one which we find. Though not frequent, there are enough of these mummified spellings to require a special term for convenient reference: morphographemes. A morphographeme is an item in which a spelling may be described as the property of this particular item, not generalized. In some instances, it is possible at least partially to account for morpho-



graphemes. Place and personal names, for example, resist changes in orthographic habits. *Ælf* is an extremely frequent first element of personal names in OE, one with considerable prestige, and it may be fairly safely assumed that even though the back allophone of /æ/ must have been used in WS speech, when the item was written down the prestige spelling was consistently adopted. *Hærfest* is another form in which *ea* seems to be expected but does not appear. We believe it to be a morphographeme also, since there are inevitably a certain number of morphographemes in any orthography (Mod.E. and Mod.French orthographies are better than fifty percent morphographemes, impossible of description except by listing). There is, however, an etymological fact regarding this word which sheds some light on its peculiarity. WGmc. \**harubist* > \**harybist* > *herfist*, by a successive series of umlauts. Since *herfist* is the expected form — and the more frequent — its alternation with *hærfist* may be taken as morphographemic.

2.222. Metathesized forms: *ærnan* 'run' (≠ *earn* 'eagle'), *bærnan* 'burn' (≠ *bearn* 'child'), *cærse* 'cress' (≠ *cear-sið* 'a sorrowful fate', in partial contrast), *gærs* 'grass', *ærn* 'house' (≠ *hearm* 'harm', in partial contrast), *bærs* 'perch', *wærna* 'wren'. Furthermore, some show partial or complete graphic contrast with *ea* forms. The contrast which is apparently established by this set of items is considered by some scholars with whom we have talked to be impossible of explanation except by assuming a phonemic split between *ea* and *æ* at this point in the chronology. The arguments against assuming a split are these: 1) If assumed, it must further be assumed to have endured a very short time, because *ea* and *æ* do not show a differing later history either in these forms or in others; to assume, in the face of the etymological evidence, that they split into two phonemes is to weight the isolated evidence of these few spellings more heavily than we are willing to. 2) For the item *ærn*, the spelling *earn* is found at least once in Bede and so recorded by Bosworth-Toller under the lemma *ærn*. In two other instances, *cærse* and *gærs*, an excellent reason, on

graphic grounds alone, can be given to show why the *æ* spelling was retained after metathesis: the *c* and *g* in these items represent velar consonants, and the spelling *ea* would cause them to appear to represent palatal consonants (see 2.123 and especially the examples *cæfl* 'halter' and *ceافل* 'jaw' where this type of differentiation is shown). 3) *bærs* regularly alternates with *bears* in the manuscripts and may be taken as another example of the type of variation listed under 2.212. 4) It is methodologically unsound to ignore the facts of graphemic overlapping or to discount the morphographemic situations which arise within purely graphic traditions. To interpret a small number of aberrant spellings as though they surely represented genuinely contrastive phonemic facts is to analyze spellings as though they were phonemes, and thus to confuse levels of analysis. So we assume that the explanation of these items is one of chronology combined with the solidifying of a graphic tradition. Metathesis occurred after breaking was complete. At the time when the [æ̃] allophone was developing before /lc/, /rc/, and /x(c)/, these items were *rænan*, *brænan*, *cræse*, *græs*, etc. (all of these spellings DO occur in the manuscripts, most frequently at earlier dates). Thus the allophone [æ̃] did not develop in them AT THAT TIME; after metathesis, the *æ* actually represents the back allophone of /æ̃/, but is a continuation of the solidified spelling tradition which showed *æ* in these items. The graphic contrast between *æ* and *ea* here then is an accident of chronology and tradition, but the back allophone is represented throughout, and the complex assumption of a phonemic split with subsequent re-merging is rendered unnecessary.

2.223. *eall* ~ *æll*-. At least this form, and perhaps others, shows an alternation between *ea* and *æ* that is predictable in terms of stress. The back allophone is found in stressed position before /lc/ (in this instance /ll/), the front allophone in unstressed position before /l/. Since this distribution is quite consistent, we assume it to represent a genuine allophonic variation.

2.224. The development of *a* from Latin sources provides a set of apparently contradictory data. Latin *a* is found as *ea* even when not before /lc/, /rc/, or /x(c)/, as *æ* in equally unexpected environments, and as *a* in any environment. Typical examples are:

<i>meatte</i>	'mat'
<i>mattuc</i>	'mattock'
<i>catte</i>	'cat'
<i>næp</i>	'turnip'
<i>weall</i>	'wall'
<i>ælmesse</i>	'alms'
<i>earc</i>	'arc'
<i>carcern</i>	'prison'
<i>mæsse</i>	'mass'
<i>plant</i>	'plant'

It is possible to cite such examples at great length. The items showing /a/ which are known to have been borrowed early may be relatinizations or learned pronunciations. The later borrowings are consistently /a/. The items showing /æ/ (either *ea* or *æ*) are early borrowings, and they are simply mixed up in a hopeless confusion of the two allographs *æ* and *ea*. *Ea* and *æ* are always in free variation, but the distribution of allophones must be assumed to be the same as it is in native OE forms. Thus *meatte* must be assumed to contain the front member of the /æ/ phoneme even though the spelling is that of the back member; *ælmesse* contains the back member, even though the spelling is that of the front member. Where *a* is the spelling, /a/ is the phoneme; there is some hesitation by the scribes about whether to assign the foreign sound to the /a/ or /æ/ phoneme, which is entirely to be expected in the interpretation of any non-native syllabic nucleus.

2.225. The question of whether native speakers will spell allophones<sup>18</sup> with anything like the degree of consistency that we have shown for *ea* and *æ* is one which deserves perhaps more discussion than we can give it here, but we would like to indicate the direction of the resolution we would make of it. Because the Latin alphabet,

with some additions from the Runic alphabet, was used in devising OE orthography,<sup>19</sup> and because these symbols were used with a close approximation of their Latin values, scholars have assumed that OE was reduced to the writing that we find in the manuscripts by scribes who were, if not completely bi-lingual, at least sufficiently conversant with Latin to be able to set up the proper correspondences between symbol and sound. That is, on the basis of what evidence there is about how OE was reduced to writing (and there is not much), some degree of bi-lingualism on the part of the person or persons who did it must be assumed. This is no gratuitous assumption, for, as Luick observes (§53), 'Die von den Iren übernommenen Zeichen wurden im allgemeinen mit den Lautwerten verwendet, die sie bei den Iren hatten: daher (abweichend vom sonstigen Brauch) *y* für den Laut *ü*, *c* in allen Stellungen für *k*, und *f* nicht bloss für die stimmlose, sondern auch für die stimmhafte Spirans (*cyning* 'König', *ofer* 'über').' If one grants that there was some degree of bi-lingualism involved in the reduction of the language to the orthography of the manuscripts, it follows that we may expect the spelling to show the same sort of characteristics that appear in the spelling of living languages which have been reduced to writing by bilinguals, or within at least partially bi-lingual contexts, in modern times. In the latter instance the known characteristics may be summarized as being these: allophones of a single phoneme may be represented in the initial reduction to writing by two different symbols, as a result of the bi-lingual's hearing the differing phonetic values of the allophones without recognizing that they are non-contrastively distributed. In the later development of the orthography, two directions are open: either the natives who use it may insist upon maintaining this spelling difference which is actually allophonic, or the two symbols may become confused with each other and even eventually fall together. Since our evidence indicates that the first direction of development (with some small amount of confusion and falling together, which we have called 'free variation') is the one taken by OE, we cite now examples of the same type from living languages reduced to

writing under known bi-lingual conditions. Pike and Fries, in 'Coexistent phonemic systems' (Lang.25.40, 1949), concerning Cakchiquel, a Mayan language of Guatemala, write as follows: 'There /v/ non-phonemically unvoices at the ends of words, whereas Spanish initially distinguishes /v/ and /f/. Although loans with [f] seem to be highly restricted (possibly to a few names) in Cakchiquel, the bi-linguals have strongly insisted upon using both "v" and "f" in preparing written materials.' In the same article, they report from Morris Swadesh, 'Observations of pattern impact on the phonetics of bilinguals', Sapir memorial volume (Language, culture and personality) 49-65: '[In Tarascan] bilinguals literate in Spanish were attempting to indicate in their writing the non-phonemic voicelessness of phrase-final vowels. Some of the bi-linguals started to write the voiceless vowels with the reversed apostrophe which was being used to mark Tarascan aspirated stops.' From Pike in conversation at the Midwest Conference of Linguists (University of Michigan, Summer 1951), we have the example of Quechua, which has three vowel phonemes /i a u/ with the allophones [e o] occurring as members of /i u/ in the neighborhood of a velar consonant. Bi-linguals again have insisted on writing the difference between [ki] and [k̟e], [ku] and [k̟o] even though only two vowel phonemes are represented, /i/ and /u/. It is Pike's opinion that this type of orthographical situation is the norm and in no way unexpected, since it is generally, though not always, the bi-lingual who reduces a language to writing. We hold with this point of view and believe it is a generalization which has value in dealing with older orthographies.

3. Conclusion. Our study utilized techniques which are in certain essentials, though not by all means all, new to historical analysis, and it therefore calls for more extensive testing of both the method in general and the details of this study in particular. We shall not be surprised to find ourselves in error either of detail or method, since the reformulation of certain aspects of historical Germanic linguistics, while an undertaking long

overdue, is not without its difficulties. As an indication of direction, examine the new speculations about the phenomena occurring before breaking and lengthening clusters which result from this simple hypothesis: lengthening before lengthening clusters appears now to be a further extension of breaking; i. e., the allophone [æ<sup>ʔ</sup>] in certain special environments where the back quality of the following consonant was most noticeable actually developed a full off-glide in those environments, becoming /æh/ and thus falling in with that already existent complex nucleus. This and other problems of restatement, resulting from the application of more highly rigid methods of descriptive analysis to historical linguistics in the field of the older Germanic languages, are matters which the writers plan to continue investigating.

<sup>1</sup>Professor A.A. Hill, in a seminar at the University of Virginia, proposed this investigation to the writers and has guided it throughout. His criticism and suggestions have been invaluable, but any errors the paper may contain are original with us.

<sup>2</sup>W.F. Bryan, *Studies in the dialects of the Kentish Charters of the Old English period* (Menasha, Wisc., 1915); K.D. Bülbring, *Altenglisches Elementarbuch* (Heidelberg, 1902); F. Dieter, *Laut- und Formenlehre der altgermanischen Dialekte* (Leipzig, 1892); F. Kluge, *Geschichte der englischen Sprache*, Paul's Grundriß<sup>2</sup> (Strassburg, 1900 sqq.); K. Luick, *Historische Grammatik der englischen Sprache* (Leipzig, 1914 sqq.); E. Sievers, *Angelsächsische Grammatik* (Halle, 1882); Sievers-Cook, *Grammar of Old English* (Boston, 1887); T.N. Toller, *An Anglo-Saxon dictionary, based on mss. of J. Bosworth* (Oxford, 1882-98), and *Supplement* (1908); all referred to, when necessary, by the last name of author.

<sup>3</sup>A.C. Baugh, *History of the English language* (New York, 1935); K. Brunner, *Abriss der mittelenglischen Grammatik* (Halle, 1948); J. Delcourt, *Initiation à l'étude historique de l'anglais* (Paris, 1944); M. Daunt, *Old English sound-changes reconsidered in relation to scribal tradition and practice* (Transactions of the Philological Society, 1939); O.F. Emerson, *History of the English language* (New York, 1922); E. Grosse, *Die neuenglische EA-Schreibung, ein Beitrag zur Geschichte der neuenglischen Orthographie* (Leipzig, 1937); H. Hallqvist, *Studies in Old English fractured ea* (Lund, 1948); F. Holthausen, *Altenglisches etymologisches Wörterbuch* (Heidelberg, 1934); R.L. Huchon, *Histoire de la langue anglaise* (Paris, 1923); R. Jordan, *Handbuch der mittelenglischen Grammatik* (Heidelberg, 1925); S. Moore and T.A. Knott, *Elements of Old English*<sup>9</sup> (Ann Arbor, 1942); S. Moore, *Historical outlines of English phonology and morphology*<sup>2</sup> (Ann Arbor, 1929); M.S. Serjeantson, *A history of foreign words in English* (New York, 1936); Sievers-Brunner, *Angel-*

sächsische Grammatik (Halle, 1942); J.W. Watson, Jr., Smoothing and Palatalumlaut in Northumbrian, English Studies in Honor of James Southall Wilson (Charlottesville, 1951); J.W. Watson, Jr., Northumbrian Old English *eo* and *ea*, Lang. 22 (1946); J. Wright and E.M. Wright, Old English grammar<sup>3</sup> (London, 1925); H.C. Wyld, Short history of English (New York, 1929); all referred to, when necessary, by last name of author. M. Joos, Acoustic phonetics (Lang. Monograph No. 23, 1948) is referred to in the same manner where corroboratory phonetic evidence was required.

<sup>4</sup>George L. Trager and Henry Lee Smith, Jr., 'A Chronology of Indo-Hittite', SIL 8.61-70 (1950) have stated the hypothesis regarding the nature of the 'long' vowels of the older Germanic languages which we are here utilizing and, on a very small scale, testing.

<sup>5</sup>Cf. George L. Trager and Henry Lee Smith Jr., An outline of English Structure (SIL:OP3, 1951).

<sup>6</sup>Marjorie Daunt, in 'Old English Sound-Changes' (see fn. 3), holds the traditional interpretation of OE vowels suspect on much the same grounds that we do, namely the unlikelihood of two types of diphthongs distinguished by length alone. She is, so far as we know, the only person who has published an opinion so similar to our own. But her manner of explaining these spellings - as 'diacritics' to indicate the color of surrounding consonants - leads to an excessively complex phonemic structure. Furthermore, while she writes in terms of phonemes, her suggestion that the stages of development could exist contemporaneously (in a single dialect) would seem to prevent any genuinely structural view of the OE sound system.

<sup>7</sup>Our terms graph, grapheme, and allograph are employed on the basis of the obvious analogy to phone, phoneme, and allophone. They imply, of course, for the analysis of writing, methods which closely parallel methods used in the analysis of utterances, with the principal reservation that while there are not any overlapping phonemes, there are certainly overlapping graphemes to be dealt with. We have dealt extensively with graphemic theory elsewhere (RPS's dissertation, not complete at this time but to be available by the spring of 1952), but feel that this brief statement is sufficient to indicate what is meant by our terminology without the further amplification which would be desirable if space permitted.

<sup>8</sup>Instances of <a> in minimal contrast with <æ> in every occurrence of a pair of items are nearly impossible to find. That is, <a> and <æ> may well overlap so much as to make them appear to be in free graphic variation and possibly allophones of a single phoneme. Yet while there may not be any items that maintain a perfectly consistent minimal contrast between <æ> and <a>, there are several distributional facts that seem to deny the possibility of including what was written with *a* among the allophones of /æ/, and since there is no regularity in the variation of *a* and *æ*, it has appeared to be more satisfactory to set the two up as differing graphemes, but with *overlapping*. The distributional points that preclude the possibility of including *a* with /æ/ are of several types, but they all add up to the clinching fact that the complementary distribution which at one time must have existed between [æ] and [a] has been upset by the time of the earliest recorded material. Some of these points are: 1) The existence of both [æ] and [a] before

double consonant plus back vowel where originally only [ɑ] was possible, as in *læccan* 'to seize', *gemæcca* 'mate', *wæcca* 'exile' (all of which have variants with *e*, from umlaut); cf. the expected *a* in *assa* 'donkey', *maffa* 'caul', *mattoc* 'mattock', etc. 2) The preservation (by analogy with the infinitive; see Wright § 58, note) of *a* in the present participle and gerund of class VI strong verbs, where *æ* is required for complementary distribution, as in *farende* for the expected \**færende*, and *farende* for expected \**færenne*. This single analogical formation, since it runs throughout the verbs of class VI, is sufficient to upset the original allophonic distribution. 3) The regular alternation of *a* and *o* before nasals; this fact requires that <*a*> and <*o*> be described as overlapping graphemes, but one could hardly maintain that they are anything but symbols for differing phonemes with a simple reduction of opposition in this position (exactly parallel to the similar reduction of opposition between /*i*/ and /*e*/ before nasals in many Mod.E. dialects). The methodological principle illustrated by this fact is that the reduction of opposition in a specific environment alone does not establish complementary distribution, nor does graphic overlapping necessarily mean that only one phoneme is involved. The distributional matters listed under (1), (2), and (3) show that it is impossible to delimit precisely all the conditions of complementary distribution between *a* and *æ*, and such precise delimitation is prerequisite to the statement that two symbols represent a single phoneme. 4) Finally, the schematic relation of the 'short' vowels to the 'long' vowels, and the differing development of <*æ*> and <*a*> after lengthening, requires that *a* and *æ* be kept phonemically apart in spite of overlapping and in spite of the numerous items apparently having either morphographic variation between *a* and *æ*, or else constituting variants. *æ* with lengthening normally gives Mod.E. /*iy*/; *a* with early lengthening normally gives Mod.E. /*ow*/; with late lengthening *a* normally gives Mod.E. /*ey*/. Thus OE *ald* > *āld* > Mod.E. /*owld*/; OE *nama* > *nāme* > Mod.E. /*neym*/.

<sup>9</sup>This symbolization is to be read both horizontally and vertically.

<sup>10</sup>We use here the traditional terminology regarding these secondary developments purely as a matter of convenience, though we regard the process of "lengthening" as being the development of an off-glide following a simple nucleus, thus creating a complex nucleus or "long vowel". See Trager and Smith in the works cited (fns. 4 and 5).

<sup>11</sup>It will be noted that the environments listed under ABC include only the conditions of breaking, since condition C is purely descriptive statement; it includes *ealu*, which comes from back umlaut in Mercian and is borrowed into WS, and forms like *nearu*, which result from vocalization of the *w* found in the oblique cases (e.g., *nearwes*), and are actually breaking forms. If the lemma forms were those with *w*, it would not be necessary to include condition C except for the form *ealu*. Back umlaut, A Mercian phenomenon, does not occur in WS, and all forms like *ealu* are assumed to be borrowings from Mercian. /*æ*/ before /*cu*/ (the conditions of back umlaut) > /*a*/ in WS, > /*a*/ in NH, and > /*æ*/ in Mercian. See the dialect chart (2.124) and the chronology (2.128) for the correspondences. Condition D, the matter of preceding palatals, is subsequently dealt with in full detail.

<sup>12</sup>Note that /*l*/ alone does not normally cause /*æ*/ to be spelled *ea*, whereas /*l*. plus consonant, including another /*l*/ as in *eall*/*æll*/, does.



13 c and u within such phonemic notations as this mean respectively any consonant phoneme and any back vowel.

14 In Kentish the front allophone [æ] was lost by coalescence with /e/ in the 'zweite Aufhellung.' *Ea*, which until this coalescence was [æʔ], then came to be the phonemic norm and only allophone of /æ/. Its phonetic status in Kent thereafter is uncertain. Since there is no clear evidence about its phonetic quality, to keep correspondences clear we have continued to write it [æʔ]. It is quite possible that when [æ] > [e], [æʔ] then > [æ], but regardless of what the details of phonetic fact are here, our hypothesis remains unaffected.

15 Wyld § 115, Moore § 65.3, Jordan § 75, *et al.*

16 When the environment included other operative factors like breaking clusters, as in *cierm* 'chirm', the back allophone was represented and quite normally in either chronology would umlaut to *ie*.

17 The few apparent contrasts are listed and discussed in 2.22.

18 The question was raised by Professor Herbert Penzl, University of Michigan, during the 1951 summer session of the Linguistic Program at the University of Michigan when parts of this paper were read at a luncheon forum. For some of the examples given we are indebted to Professor Kenneth L. Pike.

19 Luick, § 52ff.

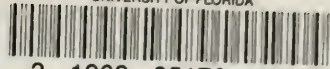


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