On the Natural History of Diphthongs*

David Stampe
Ohio State University

This paper is a minor contribution to the study of natural phonological processes. Its topic is the origin and development of certain diphthongs, namely the sort that resulted from the English Vowel Shift, but it is limited to those developments which were context-free, and which are therefore to be explained by the character of the vowels and diphthongs themselves. There are of course many other diphthong developments besides these.

Getting the Vowel Shift Straight.

Chomsky and Halle's analysis of the English Vowel Shift asserts that high vowels, which had been diphthongized, changed places with mid vowels (2), and then low vowels became mid (3):[1]

(1) $\emptyset \rightarrow \begin{bmatrix} -\text{voc} \\ -\text{cons} \\ \alpha\text{back} \end{bmatrix} / \begin{bmatrix} +\text{voc} \\ -\text{cons} \\ +\text{tense} \\ +\text{high} \\ \alpha\text{back} \end{bmatrix} \_\_$ (ī → ɪ̄i̯, ū → ʊ̄u̯)

(2) $\begin{bmatrix} \alpha\text{high} \\ -\text{low} \end{bmatrix} \rightarrow [-\alpha\text{high}] / \begin{bmatrix} +\overline{\text{tense}} \\ +\text{stress} \end{bmatrix}$ (ɪ̄i̯ → ēi̯, ʊ̄u̯ → ōu̯; ē → ī, ō → ū)

(3) $\begin{bmatrix} \alpha\text{back} \\ \alpha\text{around} \end{bmatrix} \rightarrow [-\text{low}]$ (ǣ → ē, ɔ̄ → ō)

(4) $[-\text{low}] \rightarrow [-\text{tense}] / \_\_ \begin{bmatrix} -\text{voc} \\ -\text{cons} \end{bmatrix}$ (ēi̯ → ei̯, ōu̯ → ou̯)

It is pretty hard to imagine an explanation for the exchange (2). Traditional analyses have separated the lowering of the diphthongs from the raising of the monop thongs, so that these contrary changes could be separately explained. Such an alternative is rejected by Chomsky and Halle as motivated merely by presuppositions about the nature of sound change. Since they offer no better reasons for accepting their exchange analysis, it seems to me this could be motivation enough.

But there is also some evidence for the traditional analysis. The exchange analysis presupposes that the high diphthongs resulting from Middle English ī ū were tense (1). Chomsky and Halle offer no evidence for this, and in fact the orthoepists they quote all have lax reflexes, so that a special laxing rule (4) has to be dragged in.

In fact the diphthongs were lax to begin with. To see this we have to consider the fate of glides in Middle English. The only one relevant to this question is the u̯ glide which had arisen before x, as in taught < taght (Wright 1928:58). x was lost or changed to f, and the glide was then absorbed by f; thus while taught has the regular ɔ derived from Middle English au̯, laugh and draught have the reflex of Middle English a (125). This glide absorption had more general effects, which the handbooks I have seen do not notice. Modern English lacks the expected reflex of Middle English ū before labial and velar consonants: in its place we have the reflex of lax u: plum, instead of *[plau̯m], for Middle English plūme, dove [dʌv] for dūve, duck for dūke, suck for sūken, rough for rūgh.[2] And before palatal consonants, likewise, we have the reflex of Middle English lax i rather than that of tense ī: ditch, instead of *[dai̯č], from Middle English dīch (compare dīke). The explanation seems clear. The high tense vowels had become lax diphthongs:

(5) dīč plūme dūke
>dii̯č >pluu̯me >duu̯ke

and then, by the same process that changed [drauft] to [draft], the glides were absorbed by homorganic consonants:[3]

(6) dii̯č pluu̯me duu̯ke
>dič >plume >duke

The fact that lax vowels remain after glides were absorbed shows that the diphthongs were not tense, as Chomsky and Halle assume, but lax.

One reason that Chomsky and Halle insisted on their analysis is that the binary features with which they represent vowel height[4] are inherently incapable of expressing the traditional view that in the Vowel Shift the tense monophthongs each were raised one degree of height. I will argue that this conclusion and also the conclusion that the diphthongs were lax is crucial to understanding the Vowel Shift.

A Theory of Vowels.

The theory of vowel systems of Patricia Miller (1972) is the basis for the explanations I will propose. Miller's theory concerns only simple vowels, but I will argue that it extends to diphthongs as well.

According to the theory vowels have three cardinal properties: sonority, palatality, and labiality:

(7) PALATAL — i — u — LABIAL

a

SONORANT

Sonority, the syllabic and tone-bearing property of vowels, is optimized by a maximally open and minimally constricted vocal tract: the most sonorant vowel is a. Palatality and labiality are "chromatic" properties,[5] and they are optimized by a minimally open and maximally constricted vocal tract. The most palatal vowel is i and the most labial is u. If contextual factors do not interfere, vowels tend to polarize the three cardinal properties.

Raising.

Therefore while achromatic vowels tend to lower, chromatic vowels tend to rise:

(8)
i		y		u
e	↑	ø	↑	o
æ		œ		ɔ

It is this tendency which expresses itself as the process of raising:[6]

(9) $\begin{bmatrix} \text{chr} & \text{!lo} \\ \text{V} & \text{!tns} \end{bmatrix}$ → higher

The change "higher" involves each vowel affected rising one degree of height. The process is stated in its strongest form, as it commonly applies in the earliest speech of children. It may be limited just to tense vowels, as it was in the Vowel Shift, and it may be limited just to low vowels.[7]

In the Vowel Shift high tense vowels had previously been diphthongized. Then raising applied first to both colors.

(10)
e	→	ī	see		ō	→	ū	do
æ	→	ē	sea		ɔ̄	→	ō	so

and later, after ā had become ǣ, to palatals only:

(11)
e	→	ī	sea
æ	→	ē	sake

The first phrase is illustrated by the 16th century speech of Hart, the second by the 17th century speech of Cooper (Chomsky and Halle: Chapter 6).

The color-series seem to be potentially independent in all processes affecting chromatic vowels, except that labiopalatals are affected by any process affecting either palatals or labials.[8]

Diphthongization.

In accordance with our finding that the reflexes of Middle English diphthongization were lax, the process can be formulated as:

(12) $\begin{bmatrix} \text{chr.} & \text{!hi} \\ \text{V} & \text{!tns} \end{bmatrix}$ → [-tns] [-syl]

The process may be limited to high vowels as in Middle English:

(13) ī → iɨ̯ high ū → uɤ̯ how

But it may extend to mid vowels, as it has since in English since the 18th century,

(14)
ī	→	iɨ̯	he		ū	→	uɤ̯	who
ē	→	eɨ̯	hate		o	→	oɤ̯	hoe

and even to low vowels, as in some American dialects:

(15) ǣ → æɤ̯ had ɔ̄ → ɔɤ̯ saw

Diphthongization does not affect nonchromatic vowels,[9] and is therefore to be understood as a polarization of color. This is accomplished by the development of the nonsyllabic. Nonsyllabics are more intensely colored than the corresponding syllabics, as is apparent, for example, in the fact that they often color adjacent consonants while nonsyllabics fail to. In English the palatal nonsyllabic may palatalize a preceding apical, as in gotcha for got you, but the corresponding syllabic does not: got it.

In high vowels, diphthongization of this sort seems to be a surrogate for raising. For lower vowels it has the same function, in that it allows them to intensify their color without merging with the next vowel up.

Developments of the diphthongs.

In their initial appearance, as indicated in the formulation of the diphthongization process (12), and evidenced by the reflexes of glide absorption in Middle English, the diphthongs under consideration consisted of syllabic and nonsyllabic elements which were homorganic. My explanation of diphthongization suggests that these elements function as sonorant and coloration, respectively. This is borne out by subsequent developments.

The nonsyllabic, if it is not already high, is raised: the reflexes eɤ̯.oɤ̯ of the second diphthongization became eɨ̯ oɤ̯ (14) and æɤ̯ ɔɤ̯ became æɤ̯ ɔɤ̯ (15, compare further 22b). Since such nonsyllabics as these are chromatic and tense (tenser, in my judgment, than the corresponding tense syllabics), and since they are raised by degrees, it seems likely that their raising is due to the same process (9) that raises chromatic vowels in general.[10] Raising of chromatic nonsyllabics is not, after all, peculiar to the sort of diphthongs under discussion.

Since the color of the diphthong is polarized in the nonsyllabic element, the syllabic element is left to carry the syllable pulse

and its accentual features. This is best accomplished by a relatively sonorous vowel, and the subsequent development of the syllabic typically polarizes this property. But just as the polarization of color in the nonsyllabic is achieved not through arbitrary changes but rather through a process (raising) which serves also to polarize the color of simple vowels, so also the polarization of sonority in the syllabic is achieved through processes which also may affect simple vowels: lowering and bleaching.

Lowering.

Lowering is the complement of raising; it ordinarily affects only the vowels that raising doesn't affect--the achromatics--and its motivation is obviously to increase the one cardinal property of these vowels--their sonority.

(16) $\begin{bmatrix} !\text{-chr.} & !\text{hi} \\ \text{V} & !\text{lax} \end{bmatrix} \rightarrow$ lower

Lowering changed English ɨ (<ME ŭ) to ʌ, and it is responsible for the change of ʌ to a in Russian akanʹe and its counterpart in many languages. Although lowering normally affects only achromatic vowels, there are a few examples of it applying to lax chromatic vowels. One is the lowered-though rounded-reflex of Middle English u reported by Wright (1905) for many British dialects. Since in sister dialects u was unrounded, it appears likely that the relative achromaticity of lax vowels is responsible for their occasional lowering.

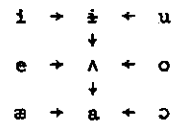
Bleaching.

Bleaching depalatalizes and delabializes vowels.[11] By eliminating their palatal or labial constrictions, it increases the sonority of the vowels it affects:

(17) $\begin{bmatrix} \text{V} & !\text{lo} \\ & !\text{lax} \end{bmatrix} \rightarrow$ -lab and/or -pal

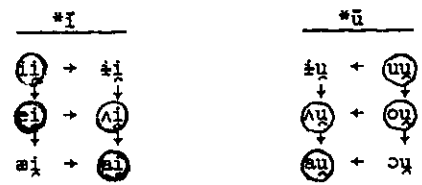
Like other processes referring to chromaticity, it may affect just palatals or just labials, or both series. Low vowels, the least intensely colored, are most susceptible to bleaching, as in the common changes of æ or ɔ to a; mid vowels are occasionally affected, as in the change of Indo-European e o to Sanskrit ʌ; and high vowels are affected in 'linear' vowel systems (ɨ ʌ a) described by Trubetzkoy (1969:97) and others.[12] The process is often encountered in its strongest form in the earliest speech of children, where, in conjunction with lowering, it may change all adult vowels to the optimal syllabic a.

(18)



Because of their strong coloration, high vowels resist bleaching and chromatic vowels resist lowering. But in diphthongs where color is borne in the nonsyllabic, the syllabic is freed from its color-bearing function and is especially susceptible to these processes that polarize sonority. Thus, while the corresponding monophthongs were largely unaffected, the diphthongs journeyed through lowering and bleaching toward aɨ aʉ:[13]

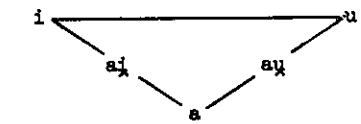
(19)



In (19) the most widely attested reflexes are circled. These suggest that the usual path of the diphthongs is a zigzag one. This is precisely the path that the relative susceptibilities of the various syllabics to lowering (!higher) and bleaching (!lower) and lowering again (!achromatic) would lead us to expect.[14]

The triangular convergence of these paths reminds us of the typically triangular pattern of systems of simple vowels, which in the extreme case consists of just three vowels of optimal palatality, labiality, and sonority (7). As Miller has demonstrated, triangular patterns are a consequence of the polarizing processes we have discussed above. Diphthongs which polarize sonority and color as syllabic and nonsyllabic are even more susceptible to these processes than the corresponding simple vowels. It is for this reason that, even in languages with rich vowel systems, sonority-color diphthongs are often limited to the optimal cases aɨ aʉ--in which the familiar triangle is implicit:[15]

(20)



Causality.

In seeking to understand the phonetic causality of the processes discussed here, it is necessary to distinguish secondary or contributing causes from primary ones. The change of ʌɨ ʌʉ to aɨ aʉ in Canadian dialects is limited to contexts before voiced segments: haʉz house (verb) beside hʌʉs (noun). We know that the

context cannot be the primary cause here because in other dialects the change is carried out regardless of voicing: haus (noun). Voicing is merely a contributing cause; it lengthens the diphthong (exactly as it lengthens the simple vowel of bʌ̄z buzz beside bʌs bus) and thereby contributes to its susceptibility to lowering, a process which favors tenser vowels.

Similarly, although lowering affects ʌ only in diphthongs while simple ʌ is unaffected (buzz, bus), the diphthongal context can only be a secondary cause, since in many other languages (e.g. Indo-European dialects except Indo-Iranian) ʌ becomes a regardless of context. The primary causality of lowering is clearly to be sought in some property (e.g. sonority) of the segment affected. The diphthongal context merely favors this self-motivated change by transferring the height- and color-marking role from the syllabic to the nonsyllabic, so that the sonority of the syllabic need not be constrained by its height or color.[16]

Contrary tendencies.

The context-free development of diphthongs is a centrifugal tendency which begins with a chromatic syllable splitting its simultaneous but incompatible properties of sonority and color into sequential elements, which then polarize and dissimilate these properties to the extremes of the vowel triangle. This development must be contrasted with the opposite centripetal tendency, where the elements of a diphthong attract each other: aį becomes eį (Gothic stains, Middle High German stein 'stone') or aę (Greek Αινείας, Latin Aeneas). Assimilation typically ends in a coalescence of the diphthongal elements as a monophthong: Old Saxon stēn, Old English stān 'stone'.[17]

The change of aį to eį in German was followed by a change back to aį (Stein). These contradictory changes do not present an inexplicable paradox, for they clearly represent separate but contrary causalities. The change of *staįn to steįn was the same assimilatory process (palatal umlaut) that changed *manni to *menni 'men', while the later change of steįn back to staįn was the same dissimilatory development (bleaching and lowering) that changed meįn (<mĭn) to maįn 'my'. In the first case the vowel responded to its palatal context, in the second to its own sonority.[18]

The distinct motivations of assimilative and polarizing processes are especially clear in the contrast between hyperarticulated and hypoarticulated speech styles. English aį is pronounced as such only in very careful speech; it becomes aę in ordinary speech and ā in casual speech, e.g. āmĭr I'm here. This assimilative, monophthongizing tendency in increasingly hypoarticulated speech is paralleled in reverse by a diphthongizing, dissimilatory tendency in hyperarticulated speech. In some Southern U.S. dialects æ is heard only in rapid speech and is diphthongized to æę in ordinary speech; in emphatic articulation it may polarize further to æį or aę.

(23)

	Hyperartic.		Normal		Hypoart.
(a)	aį	→	aę	→	ā
(b)	æį	→	æę	→	æ

Despite the contrary history of these sounds, indicated by the arrows, it is obvious that in strong articulation polarization occurs and in weak articulation assimilation occurs.

Polarizing and assimilating processes, although contrary in results, are in fact uniform responses to the contrary demands of clarity and ease which the earliest phonologists recognized as the constant state of spoken language. Language is a complex institution, responding to needs which are often in conflict, and these are reflected in conflicting tendencies in its nature and development.[19]

Footnotes

*This paper, which has benefited from discussions with Patricia Miller and many others, is dedicated to Harold Whitehall.

[1]These are the rules Chomsky and Halle (1968:265) propose for the 16th c. speech of John Hart. None of the rules (1-4) survive the diachronic evidence presented here, but of course this doesn't necessarily bear on their synchronic status.

[2]After the adoption of French orthography, tense ū was spelled ou.

[3]Glide absorption can be dated after the loss of x (hence taught with ɔ < aų), and before the change of havok 'hawk' to hauk and the lengthening of i u to ē ō in open syllables (wik: wēkes 'week: week's', Wright 1928:43f), since rūm 'room' > ruųm > rum and by lengthening > rum : rómes, the modern form ruųm being a regular raised and diphthongized reflex of the inflected form rōm. Wright dates the lengthening in the fourteenth century; since glide absorption preceded it and diphthongization in turn preceded glide absorption, I conclude that the Vowel Shift began at least a century earlier than the 15th c. date of Chomsky and Halle (1968:256) and others.

[4]This representation is required, according to Halle (1957), by the 'evaluation measure' of generative phonology.

[5]Chromatic properties cross-cut Trubetzkoy's classification of oppositions (1969:74ff) in being privative, in that certain vowels (e.g. ɨ ʌ a) lack them entirely, and gradual, in that there are degrees of chromaticity (Ĭ is more palatal than i or ȳ or ē, and į more palatal than Ĭ). These properties, unlike the features of Jakobson, Fant, and Halle (1951) or Chomsky and Halle (1968: Ch. 7), are deduced from the behavior of sounds in natural processes, on the assumption that like sounds respond to like

causalities. Thus the cover term chromatic is suggested by the parallel behavior of palatal and labial vowels in many processes. Given our small knowledge of these processes, our identification of significant properties is undoubtedly full of error.

[6]The notation !lo !tns means the lower or tenser a vowel is, the more susceptible it is to the process. For more detail and examples of these processes in monophthong systems, see Miller (1972a).

[7]Thus lax vowels are not raised unless the corresponding tense vowels are, and mid vowels are not raised unless the corresponding low vowels are. It is this 'implicational' hierarchy that shows raising of mid and low vowels to be the same process.

[8]For example, the next process to be discussed, diphthongization of high chromatic vowels, affected ỹ as well as ĩ and ũ in Dutch and German.

[9]Apparent cases like Mod. Icelandic ã > aɥ presumably involve the prior change ã > ɔ̃ (cf. OE stān 'stone' > ME stɔ̃n, etc.), diphthongization ɔ̃ > ɔɷ, raising ɔɷ > ɔo > ɔɥ, and bleaching ɔɥ > aɥ (see below, and compare note 15).

[10]The implication of this assumption, that the raising of syllabics should presuppose a raising of corresponding nonsyllabics is not disappointed by any language I know.

[11]This process is a restricted version of neutralization (discussed in Miller (1972a, b)), which in its strongest form would neutralize height as well as color.

[12]The change of u to ɨ in English and Japanese, for example, while o remains round except in American English (hot), seems to reverse this hierarchy. So does the change in certain dialects of oɥ (toe) to ʌɥ while uɥ (too) remains or only optionally changes to ɨɥ. I think there is something we don't yet understand about back round vowels, possibly that there is a kind of o (retracted?) which is less subject than the other o to bleaching and other processes. This might solve the riddle of why in some vowel systems (esp. Amerindian ones) the sole back round vowel is not u but o.

[13]Early descriptions do not distinguish between ɨ and ʌ, perhaps due to the subtlety of the distinction, but ɨɥ survives in some Piedmont dialects. ʌi and ʌɥ alternate with ai aɥ in lengthening contexts in Canada and some U.S. dialects. The reflex æi is not attested, to my knowledge, and ɔɥ is described only by Batchelor (1809, quoted in Chomsky and Halle 1968: Ch. 6). Batchelor's palatal reflex is ʌi, which indicates an asymmetry in the application of lowering and bleaching (but cf. note 14).

[14]It is possible, and not improbable, given the resistance of chromatic vowels to lowering, that these developments always involve some degree of bleaching, so that the underlying path of the diphthongs is 'down the center', and surface manifestations like ei oɥ are due to assimilation of the underlying achromatic syllabic to the color of the syllabic. This sort of assimilation to glides is familiar from Caucasian languages (Trubetzkoy 1969: 97),

Korean (Kim 1968), etc. The zigzag path of the attested pronunciations would then follow from various susceptibilities not to lowering and bleaching but to color-assimilation, since lower vowels are less responsive to color (compare the hierarchies in color assimilation in Adyghe and Abkhas in Trubetzkoy loc. cit.). Batchelor's asymmetric reflexes (note 14) ʌi ɔɥ would then be due to labialization of ʌɥ without the corresponding palatalization of ʌi.

[15]My discussion of color is limited in this paper to its competition with sonority, but palatality and labiality are not wholly compatible properties either, as is evident from the common simplification of mixed vowels (usually by delabialization, y → i, but occasionally by depalatalization, y → u). The change of œy (the diphthongized and lowered reflex of ỹ in the German Vowel Shift) to ɔy or ɔi is such a simplification of color, with apparently dissimilative motives. Dissimilation of color also plays a role in the change of English aɥ to æɥ in many dialects and ai to ɔi in some, e.g. Cockney, and in the change of ɨu ʌɥ (the bleached reflexes of uɥ (too), oɥ (toe), note 12) to iɥ eɥ, though all these changes can be paralleled in simple vowels (Miller 1972a, b). The opposite dissimilation has changed Faroese ɨi (which I assume as the diphthongized and bleached reflex of ĩ) to ui, while the reflex of ũ remains ɯɥ (Andersen 1972:22, with a different analysis).

English iɥ eɥ seem in some individuals to undergo monophthongization to ỹ ø̃. This suggests a re-evaluation of the putatively simple change u > y, often joined by o > ø, which is reported for many languages. If the change were really due to diphthongization u > uɥ, bleaching uɥ > ɨɥ, color-dissimilation ɨɥ > iɥ, and monophthongization iɥ > y, then some coincidental properties of the "fronting" change and diphthongization would be explained, e.g. that both favor tense and higher vowels. Furthermore languages with y from u typically lack the diphthong iɥ, and the monophthongization assumed to give y would explain this lack. Finally, the peculiar round central vowel ɯ̃ which derives from Swedish ũ could be derived by diphthongization, bleaching, and (without color-dissimilation) monophthongization of ɨɥ to ɯ.

This hypothesis, that context-free fronting of labial vowels occurs via diphthongization, furnishes a potential clue to the otherwise insoluble riddle (Wright 1928:94, 99) of why French y (pur 'pure') was borrowed in Middle English as a diphthong iu when there existed, in Anglian at least, an identical y (fȳr 'fire', kyn 'kin'). Since Danish y was borrowed as y, the explanation for the diphthong has to lie in French. The obvious answer is to assume that the French vowel, which derived from u, was a diphthong at the time; the derivation of y from u via iɥ is encouraged by the parallel development of œ from eɥ in French. (The modern borrowing of French and German y as iɥ is another matter, since English lost y in the meantime.)

In Modern Icelandic (Benediktsson 1959) lax u o have become y ø while tense ũ õ have not. This seems to demolish the diphthongal hypothesis of fronting because if lax vowels diphthongize, tense ones should too. But in fact tense vowels did diphthongize:

ī ē ǣ > iį eį æį (>ai), ū ō ɔ̄ (>ā, note 9) > uų oų ɔų (>au). The resultant diphthongs are long, whereas those we would assume from lax u o would have been short: ŭų ŏų. Now although lax vowels resist diphthongization they favor bleaching, and therefore it is not at all strange that the short diphthongs should have bleached and thus progressed to y ø, while only the low long diphthongs (æį ɔų) bleached.

To conclude this note, it appears that both the common 'vowel shift' developments u > au and u > y begin with the same process, a diphthongization u > uų motivated by a polarization of labiality.

[16]As tertiary causalities the 'systematic' factors emphasized by the Prague phonologists might be mentioned. The change of Swedish ū to ʉ̄ rather than ȳ as in most languages is obviously related to the prior existence of ȳ in Swedish. The fact that raising or some other process creates new high tense vowels (in German ie yø uo became ī ȳ ū, in Faroese i u tensed to ī ū) after diphthongization has eliminated the old ones recalls Martinet's idea of 'chain reaction'. And so forth. But these factors do not provoke extraordinary changes or distort natural changes, and in general they are not necessary conditions on change. The second raising of palatals in English (10) destroyed the symmetry of ǣ (ME ā) and (ME au) and merged ē (ME ǣ) with ī (ME ē). And if it is correct to analyze the lowering of high tense vowels in Yokuts (Kuroda 1967) as via diphthongization ī ū > iį uų, lowering iį uų > eį oų, assimilation eį oų > eę oǫ, and monophthongization eę oǫ > ę̄ ǭ, then the fact that Yokuts lacks high tense vowels can be attributed to a nonapplication of raising.

Examples like the last have shown that Jakobson's implicational law that 'a secondary [marked] value cannot exist in a linguistic system without the corresponding primary [unmarked] value' (1968:59) was mistaken. When Icelandic u o became y ø (note 15) 'marked' values displaced 'unmarked' values and the latter have not been replaced. 'Markedness' and systematic properties are the result, not the cause, of the nature and application of natural processes; as Miller (1972a) shows, these processes are capable of producing not only the 'expected' triangular system, but also 'unexpected' systems like the Icelandic i e a ɔ ø y, the Caucasian linear ɨ ʌ a (which Jakobson 1968:84 compares to color-blindness!), and others. Panderivational causalities do not, in general, override the individual causalities of phonetically motivated processes (compare Stampe 1969).

[17]It appears that, unlike monophthongization of mixed-color diphthongs (e.g. iu > y, note 15), monophthongization of sonority-color diphthongs always occurs through assimilation. This is why in dialects which monophthongize aį ɔį æų (buy boy cow to ā ɔ̄ ǣ the glides of eį oų (bay bow) remain; in the former diphthongs the glides were first assimilated to the low syllabic (aę ɔę æǫ). This view is supported by the fact that while many Germanic dialects monophthongized aį aų, German and Old Icelandic monophthongized them only in contexts which lowered į ų to ę ǫ: Gothic hauhs 'high', 8th c. Bavarian haoh, later OHG hōh, OIce. hór;

Gothic air 'before', 8th c. Bav. aer, OHG ēr, OIce. ār (Prokosch 1938:116f). The same facts confirm the lowering effect on the syllabic by the low nonsyllabic: while in Old Icelandic syllabic i u were lowered in these contexts, in German they were not (Prokosch 114ff); since nonsyllabic i u should be more resistant to lowering, because of their intense coloration, than syllabic i u, we must conclude that in German not only the following consonant but also the low syllabic was responsible.

If sonority-color diphthongs monophthongize only to the extent their elements become identical in height, it follows that if glide raising has applied, as in Mod. English, the high diphthongs iį uų should be more apt to monophthongize than eį oų. This is confirmed by many phoneticians who have found ī ū beside eį oų. What the phoneticians miss, since they rarely consider the full range of articulatory styles of a speaker, is that iį uų emerge in emphatic speech.

[18]It is thus absurd to imagine that language is constrained by a monolithic 'evaluation criterion', however this may be formulated. There is a serious note of truth in the pessimistic slogan that any sound may become any other. It is only by distinguishing the individual stages of change and their individual, often contrary, causalities that we can hope to transcend a mere description of such contradictory-seeming developments. Indeed, to resolve the dilemma encountered by Chomsky and Halle (1968:4) that we cannot distinguish real universals of language from apparent ones, it is only when we understand the causality of a linguistic fact--why it necessarily follows from the nature of things--that we can be certain it is a universal fact.

References

Andersen, Henning. 1972. Diphthongization. Language 48.11-50.

Benediktsson, Hreinn. 1959. The vowel system of Icelandic. Word 15.282-312.

Chomsky, Noam, and Morris Halle. 1968. The sound pattern of English. New York.

Halle, Morris. 1957. In defense of the number two. Studies presented to Joshua Whatmough, 65-72. The Hague.

Jakobson, Roman. 1968. Child language, aphasia, and phonological universals. The Hague.

Jakobson, Roman, Morris Halle, and Gunnar Fant. 1951. Preliminaries to speech analysis. Cambridge, Mass.

Kim, Chin-Wu. 1968. The vowel system of Korean. Language 44.516-527.

Kuroda, S.-Y. 1967. Yawelmani phonology. Cambridge, Mass.

Miller, Patricia Donegan. 1972a. Some context-free processes affecting vowels. Ohio State Univ. Working Papers in Linguistics 11.

Miller, Patricia Donegan. 1972b. Vowel neutralization and vowel reduction. In this volume.

Prokosch, E. 1938. A comparative German grammar. Baltimore.

Stampe, David. 1969. The acquisition of phonetic representation. Papers from the fifth regional meeting, Chicago Linguistic Society, 443-454.
Trubetzkoy, N. S. 1969. Principles of phonology. Berkeley.
Wright, Joseph. 1905. The English dialect grammar. Oxford.
Wright, Joseph and Elizabeth Mary Wright. 1928. An elementary Middle English grammar. Oxford.

Reordering in Diachronic Syntax[1]

Benjamin K. T'sou
University of California, San Diego

1. The last decade has seen a small but increasing number of linguists who have been concerned with diachronic syntax. There are now primarily two approaches to syntactic change. One view has it that syntactic change may be due to regularization in the surface structures, through which children perpetuate the innovations by optimizing the language that they are acquiring. The results of such changes may alter the input of rules and bring about regularization in a grammar which may differ from its precursor in terms of rule ordering, rule simplification and rule restructuring. Detailed examples may be found in Klima, Closs-Traugott, and Naro. The other view, brought forth by Robin Lakoff, suggests that radical changes may be the result of only changes in grammatical categories and redundancy conditions that govern rules dealing with specific classes of elements. These two views are not incompatible and it is quite likely that a more complete picture of syntactic change may be based on a combination of these and other factors.

The first view holds that syntactic change is analogous to phonological change and recently King[2] has cast serious doubts on the possibility of rule insertion in phonology. In this paper we shall be concerned with questions of rule reordering and insertion in syntax and with the relationship between reordering and changes in the deep structure. Our data are based on a study of three rules in Yes-or-No question (YNQ) derivations in Chinese dialects at different points in time.

2.1 Mandarin Dialects

When considering YNQ derivations in Mandarin it is necessary to distinguish four kinds of subgroupings.

	Md_1	Md_2	Pek_1	Pek_2					
					NP	VP	Neg	VP	$Part_F$
a	*		*		Ta	qu	bu	qu	a
					He	go	not	go	
b					Ta	qu	bu	qu	
c	*	*			Ta	qu	bu		
d	*	*	*	*	Ta	qu	bu		a
					NP	VP	$Part_Q$		
e					Ta	qu	ma		

"Is he going?"

Peking Mandarin (Pek_1 and Pek_2) differs from common Mandarin (Md_1 and Md_2) by not requiring the deletion of the sentence final particle, $Part_F$, in sentence type (c). Md_1 and Pek_1 are