

On the History of the Paradigmatic Alternations of Labio-dental Fricatives in English

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This article discusses and explains the sources of the alternations between the /f/ and /v/ sounds in English. It shows that the three main mechanisms of diachronic phonology responsible for such paradigmatic alternations are sound change, analogical change, and borrowing. Moreover, it explains the interplay between sound change and analogical change.

1. Purpose

The article sheds light on the variation between /f/ and /v/ phonemes in the singular and the plural forms in morpheme final position in a large number of words. The purpose of the article is twofold:

1) It resolves in an explicit way the bewilderment of students of English concerning the phonemic and phonetic nature of these two sounds and the correspondences that exist between sounds and spelling. Therefore, it helps them not only in spelling but also in pronunciation.

2) It fills a gap in historical linguistics by showing the operation of different diachronic processes (sound change, analogical change, and borrowing) and the interplay among these dynamic processes.

2. Introduction¹

In the study of linguistic change, it is well known that historical linguistics deals with the notion of time. Different stages of a language's development can be related chronologically as older and later stages. Evidence

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comes from the examination of written records, and the differences found can be interpreted as reflecting the historical development of the language (Hoenigswald 1960: 1-12).

To explain the alternations that exist between /f/~/v/ in Modern English (ME), we have to deal with the diachronic processes, the linguistic changes, that have led to these alternations. The most relevant changes pertinent to /f/~/v/ alternations are sound change, analogical change, and borrowing. Sporadic changes, which are not systematic or storable in either phonological or morphological terms,² are excluded from the discussion (Hoenigswald 1964).

Sound changes may be defined as changes in or function of phonetic and phonological units and systems (phonemes and their allophones). In other words, sound change must be evaluated from the point of view of its effect on the structure of sound patterns of a language, (Bynon 1977: Chapters 2 and 3). One of the main premises in historical linguistics is the regularity hypothesis of sound change : sound change admits no exceptions unless analogy and borrowing come into play (Antilla 1972; Mahadin 1987). The principle of the regularity of correspondences and sound change has served as the basis of the method of reconstruction which has been referred to as "comparative method." The comparative method, a technique by which the shapes of an ancestor language are determined by the inspection of the shapes of its descendant, presupposes that ancestor becomes descendant by the process of phonemic change alone. While this method is convenient for the linguist bent on reconstructing extinct forms, the reality of the situation is in fact otherwise. The regularity of sound change is routinely disturbed by other changes, notably analogical change, minor sound change, and different kinds of borrowing.³ Linguists, therefore, must isolate the results of

¹ / / slashes indicate phonemes, and [] square brackets indicate sounds and allophones, and * indicates reconstructed forms. The sources of the examples are: (1) The Oxford English Dictionary. A. H. Murray, H. Bradley, W. A. Craigie, and C. T. Onions, (eds) 13 vols. Oxford, 1933. (2) The Oxford English Dictionary: A Supplement. R. W. Burchfield, (ed.) Oxford, 1972. (3) Williams 1975, Pyles and Algeo 1982, and Baugh and Cable 1978, among other works mentioned in the text.

² See Hoenigswald (1964: 202-214) and (1977: 168-194) for a detailed discussion of sporadic and minor sound change as well as assumptions and contradictions in historical linguistics.

³ Only the effect of borrowing on phonology will be dealt with here. For more detailed studies, see Hoenigswald (1960: 50-58, 66-67), Bynon (1977: Chapter 6), and Jeffers and Lehiste (1979: Chapter 9).

these changes other than true sound changes before proceeding with the application of the comparative method.

For the purpose of this study, the types of sound changes that will be considered here are paradigmatic and syntagmatic changes⁴ (Hjelmslev 1947 and Martinet 1949). Either type may be further divided according to the effects they have on the phonetic and phonological levels, thus distinguishing phonetic and phonological paradigmatic changes as well as phonetic and phonological syntagmatic changes.

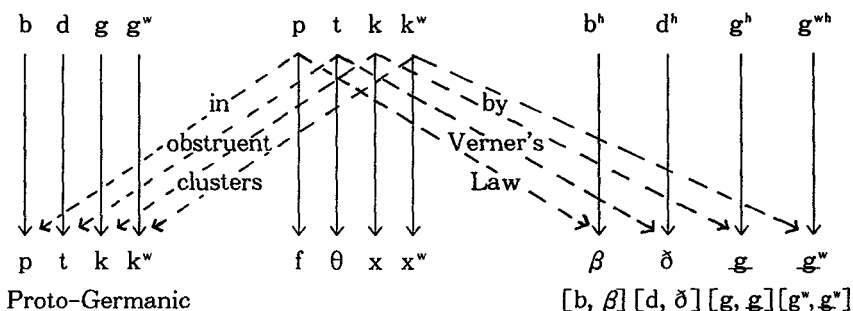
Phonetic paradigmatic changes consist of changes in the phonetic realization of the phonemes. The First Consonant Shift, or Grimm's Law, is an example of this type :

Indo-European (IE) > Proto-Germanic (Pr. Gmc.):

[b ^h , d ^h , g ^h]	>	[b, d, g]
[b, d, g]	>	[p, t, k]
[p, t, k]	>	[f, θ, h]

Because the First Consonant Shift, described by Grimm's Law, is important for the changes that have occurred in English as a result of a general shift between Germanic and other Indo-European languages, we may illustrate it by a series of changes consisting of a reconstructed Indo-European root or word, and the corresponding English word (Pyles and Algeo 1982: 89-92; Hogg 1992: 68-75; Bynon 1977: 83-86, among others). The exceptions to these regular changes were explained by Verner's law. The changes may be summarized in the following diagram (Bynon 1977: 83).

Pre-Germanic (Proto-Indo-European)



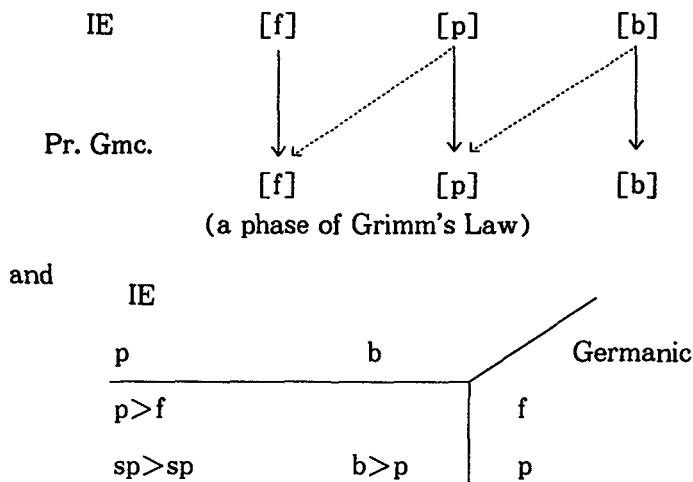
⁴ Following the tradition of functional linguists, the basic principles of phonological analysis amount to the distinction between paradigmatic and syntagmatic analysis. This distinction is mainly used by European linguists; see Hjelmslev (1947: 69-78); (1961), and Martinet (1949).

The following examples illustrate the changes that occurred between IE., Pr. Gmc., and OE : (only the changes relevant to this article will be mentioned).

*IE	>	*Pr. Gmc.	>	OE	Modern English
(1) /b ^h /		/b/		/b/	
b ^h er-		ber-		beran	“bear”
(2) /b ^h /		/b/		/f/	
lub ^h -		lub-		lufian, lufu	“to love, love”
(3) /p/		/f/		/f/	
plnos-		fullaz-		full	“full”
(4) /p/		/p/		/p/	
spa-		spad-		spadu	“spade”
(5) /b/		/p/		/p/	
d ^h eub-		deupa-		dēop	“deep”

(Bloomfield 1933; Antilla 1972; Bynon 1977; Pyles and Algeo 1982 — other details will be discussed below).

Here, attention should be paid to such phonetic paradigmatic changes as rise and loss of allophones. Compare the voiceless and voiced allophones of Old English (OE) fricatives, [f]~[v], [θ]~[ð], and [s]~[z] and the later changes which will be discussed below. For example, the OE /f/ had two sources: one was from Pr. Gmc. /f/ and the other was from Pr. Gmc. /b/ which had two allophones (see above). It was realized as [b] initially as in **beran* “bear”, *bær* “bare”, and it was realized as the OE /f/ medially as in *lufu* “love” and finally as in *lēof* “dear”. These changes in the phonetic paradigmatic alternations can be represented in the following figures: (Hoenigswald 1960: 78-79 and 88-89, only the labials are represented).



In short, IE /p/, but not /b/ occurred after /s/. In Pr. Gmc., IE /b/ goes to a new /p/, and /p/ generally to /f/, except for the allophone after /s/.

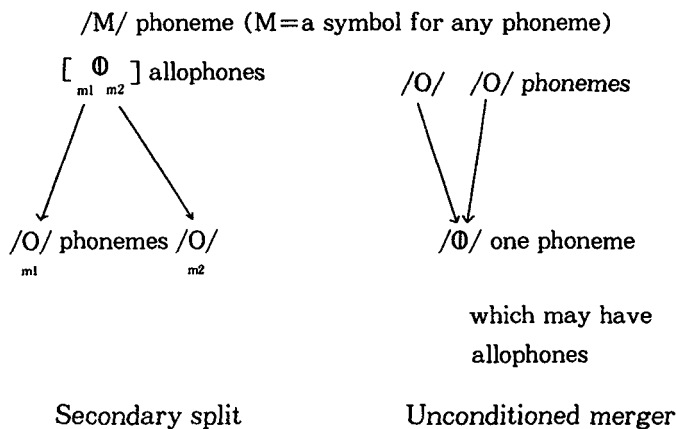
Phonological paradigmatic changes involve changes of opposition and phonemes. There may be a rise of new oppositions or a loss of old ones, or, as a special case, replacement of oppositions. For example, with the rise of the oppositions between the voiced and voiceless fricatives in Middle English (MidE): /f/~/v/, /θ/~/ð/, and /s/~/z/, the consonantal correlation according to the feature of voicing (voiced vs. voiceless), which was earlier relevant only to stops and affricates, was extended to fricatives (cf. phonetic paradigmatic changes above).

The other changes are phonetic and phonological syntagmatic changes. However, these changes are not important for this article. Phonetic syntagmatic changes consist of changes in the phonetic composition of morphemes. Phonological syntagmatic changes consist of changes in the phonological structure of morphemes.

3. A Brief Account of the Development of Fricatives

The rise of new oppositions/phonemes through the split of allophones of the same phoneme is a frequent phenomenon in language change. The phonetic prerequisite for the splitting of allophones as independent phonemes lies in the presence of appropriate allophones in the phonetic realization of

the some phonemes; it is their “phonetic similarity” which suggests a change in assignment — that is, an association with new coallophones as in the changes that took place according to Grimm’s Law in the labial series (see the above discussion and examples). Thus, phonological change of this type increases the phoneme inventory as a result of the spilt of a single phoneme into independent phonemes because of the merger of the conditioning factors (see Hoenigswald 1960: Chap. 4; Bynon 1977: 77-79).⁵ On the other hand, the merger, which decreases the number of phonemes, takes place when the phonemes merge as the result of unconditioned merger of phonemes into a single one or when the allophones of two phonemes merge in all environments. The two changes can be represented as follows: (see Hoenigswald 1960: 91-95, and Bynon 1977: 77-79 for detailed discussion and example. Also, the discussion below).



In the period before the rise of the correlation /f θ s/-/v ð z/ in English as separate phonemes, the allophones [f]~[v], [θ]~[ð], and [s]~[z] of the respective phonemes /f, θ, s/ are recognized. The /f/, /d/, and /s/ were phonemes with two phonetic realizations (allophones) for each one. For example, /f/ had two allophones [f] and [v], [v] between voiced sounds medially and [f] at the beginning of a stressed syllable, finally in a word, or next to a voiceless consonant or when doubled as in the following examples (Pyles and Algeo 1982: 108 and Hockett 1958: 376):

⁵ See Hoenigswald (1960: 76-79) for more details and other types of sound change.

voiceless allophones:

fugol/fúxol/ "bird"

deaf/dā:f/ "deaf"

scaeft/skæft/ "shaft"

pancian/θōnkian/ "to thank"

mup/mū:θ/ "mouth"

oppe/oθθe/ "or"

sae/sæ:/ "sea"

wordes/wōrdes/ "word's"

wissian/wissian/ "to direct"

cniht/knīxt/ "boy"

hlihhan/hlīxxan/ "to laugh"

(/x/ did not occur initially.)

voiced allophones:

lofian/lōfian/ "to praise"

ope/ō:θe/ "oath"

husl/hu:sl/ "eucharist"

dagas/dōxas/ "days"

Thus, the phonemization (the splitting of allophones) of the voiced and voiceless allophones of the English fricatives took place in the MidE period, while the rise of the allophones themselves took place in prehistoric times (Hogg 1992: 276-288 and Pyles & Alego 1982: 146-147).

The phonemization of the allophones involves no phonetic change: the phonetic realizations of new phonemes coincide with the allophones of the old phoneme. But it turns out that the distribution of the new phonemes is not identical with that of the allophones of the original ones. Thus, in the case of the English fricatives, after voicing had become phonemically distinctive for them and the correlation /f θ s/ ~ /v ð z/ had been established, the distribution of /f θ s/ and /v ð z/ differed from the distribution of the allophones [f]~[v], [θ]~[ð], and [s]~[z] of the respective old phonemes /f θ s/.

The changes of consonants from Middle English to Modern English have brought some changes as indicated above. For example, the final voiceless fricatives [f], [s], and [θ] become voiced [v], [z], and [ð] if they were preceded by a vowel that was without stress or if they occurred in words

that were commonly pronounced without stress in the sentence (structural words) as the following examples show: (Moore, and Marckwardt 1981: 139).

<u>Middle English</u>	<u>Modern English</u>
actif	active [æktiv]
of [ɔf]	of [əv, ɔv]
faces [fa:səs]	faces [feɪsəz]
his[hɪs]	his [hɪz]
with [wɪθ]	with [wɪð]

Moreover, the influence of the Norman Conquest on the English Language was great. A large number of French words were ultimately to become part of the English vocabulary. Also, some French spelling conventions were borrowed. For example, the consonant [v] did not occur initially in OE, which used (f) for the [v] that developed internally as in *drifēn* “driven” and *scofl* “shovel”; except for a very few words that have entered standard English from Southern English dialects, in which initial [f] was voiced as in *vixen* “she-fox” (OE *fyxe*) and *vat* (OE *fæt*). The introduction of the letter (v) (a variant of (u)) to indicate the prehistoric OE development of [f] to [v] was an innovation form of OE as in *drifēn*; it was written *driven* or *driuen*. A sequence of this influence of the Old French on the English language at that time, especially words beginning with [v] (for example, *veal*, *virtue*, *visit*), the voiced fricatives of the OE allophones of the voiceless ones, gained phonemic status. Also, the loss of final -e [ə], the voiced fricatives [v], [z], and [ð] came to occur in final position as in OE *giefan*, *gifan* > Middle English *given* > Modern English *give* [giv]; OE *losian* > Middle English *losen* > Modern English > *lose* [lu:z]; OE *bathian* > Middle English *bathen* > Modern English *bathe* [beɪð] (Pyles and Algeo 1982: 146-153; Bynon 1977: 226).

In short, the correlation of voiced vs. voiceless was established in the system of fricatives in the 13th-14th c. The contrastive distribution of voiced and voiceless fricatives was the result of the following processes (only examples relevant to this article will be given):

- 1) Loss of the consonantal correlation of long vs. short which had led to the direct contrast of voiced and voiceless fricatives in the intervocal-

ic position, viz., VfV vs. VvV, VθV vs. VðV, and VsV vs. VzV. (V = vowels; v = labio-dental fricative) as in *clyffe* "cliff", *sefen*, *seuen* "seven", *offaran* "overtake", and *offrian* "offer" (Hogg 1992: 32-33).⁶

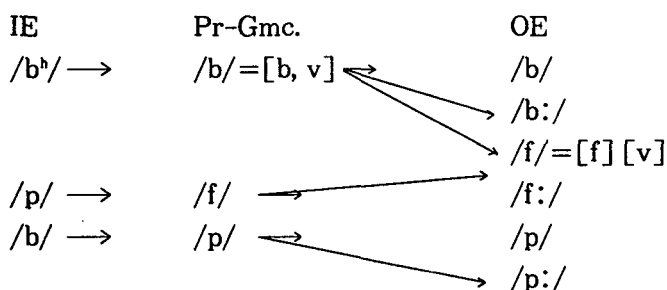
- 2) Borrowing of French words in which voiced fricatives occurred in initial position, which led to the following contrasts:⁷
f V vs. v V and sV vs. z V (see above discussion and examples).
- 3) Voicing of /f/ and /s/ in initial position (see above discussion and examples).
- 4) Loss of the final unstressed /ə/, which left voiced fricatives in final position. As indicated by Pyles and Algeo (1982: 152-153), the final *e* [ə] was gradually lost as in *bride* from OE *brȳd* and *have* < Middle English *haven* < OE *habban* (for more detailed discussion, see Moore and Marckward 1981: 59-63, 138-139).

OE had voiced and voiceless short fricative nonstop obstruents: [f]~[v], [θ]~[ð], and [s]~[z], yet their distribution was complementary, and they could be considered as voiceless and voiced allophones of the phonemes /fθs/, respectively (see above discussion and examples).

To sum up the development of the labial fricatives, one can notice the following changes.

⁶ A part from cases of internal juncture, /ff/ is extremely rare and appears to be confined to three types: (1) proper names, such as *Offa*; (2) onomatopoeia, such as *pyffan* "breath out"; loan-words such as *offrian* "offer".

⁷ Bynon (1977: 226) attributes the phonemic contrast between /v/ and /f/ to the great number of loan words from French, which have /v/. She says: "The situation is well illustrated by the change which took place in the status of the bilabial fricatives [f] and [v] in English. In Old English, prior to the influx of large numbers of loan-words from French, these can best be treated respectively as the initial-final and the medial allophones of a single phoneme. With the increasing number of loan-words from French having an initial /v/ (*village*, *veal*, *vine*, etc.), the balance was eventually altered in favour of an analysis which recognizes them as distinct phonemes".



The following examples explain such changes (Pyles and Algeo 1982; Hockett 1958; Bloomfield 1933, among others. Also, see the above examples and discussion):

*IE	>	*Pr. Gmc.	>	OE	>	Modern English
b ^h er-		ber-		beran		bear
gomb ^h os-		kambaz-		camb		comb
lūb ^h		lub-		lufian, lufu		to love, love
b ^h eb ^h ru-		bebru-		beofor		beaver
plnos-		fullaz		full		full
spa-		spad-		spadu		spade
d ^h eub-		deupa-		dēop		deep

The development of the labials is complicated, as one can see, by the fact that OE /f/ developed from Proto-Germanic /b/ and /f/. The Proto-Germanic /b/ had three cognates in OE:

- 1) /b/ : initially and after nasals as in *beran* “bare” and *camb* “comb”.
- 2) /b:/ (in position of gemination): before one of the approximants /j, w, l, r/ as in *hebban* “heave”, *crabba* “crab” (see Moore and Marckwardt (1981: 140) for a detailed discussion and examples).
- 3) /f/: medially and finally as in *lufu* “love” and *lēof* “dear”.

Finally, the main distinctions between OE and the MidE fricatives, specifically /f/ and /v/, are:

- 1) The features of quantity become non-distinctive in MidE; that is, there was no contrast between long (geminate) and short (single) consonants (see above example).
- 2) The correlation of voiced vs. voiceless /f/ as a phoneme with two allophones was extended; the allophones [f] and [v] become indepen-

dent phonemes: /f/ and /v/ (see above discussion and examples).

In ME, the two sounds /f/ and /v/ are completely independent phonemes and they are in contrast in all positions. /f/ is a labio-dental fortis (voiceless) oral fricative and /v/ is a labio-dental lenis (voiced) oral fricative (see above discussion and examples).

4. Discussion

Having reviewed the developments of the /f/ and /v/ sounds in English by tracing the phonological changes and the status of these two sounds, we come to the crucial point in this article, which needs an adequate and concrete explanation. The alternations that one can find between /f/ and /v/ in words like *wife* and *wives* can be explained by resorting to the changes that took place in the history of English and left traces in present day English. Here, the term "morphophonemics" for such alternation in the morphemes is in order, alternating morphemes which are phonologically conditioned. However, words like *cliff* and *cliffs*, where there is no such alternation between /f/ and /v/ before the plural marker as one expects, do not show the same regularity, and only /f/ appears both in the singular and the plural. Then, how can we explain such apparent irregularities between /f/ and /v/ in English? The answer is that not only is sound change in play here, but also another "regularizing" force is in operation, viz., analogy⁸ (Antilla 1977; Mahadin 1987).

There are two structural changes involved, and they are in a constant tug of war: sound change and analogy. The two mechanisms, in addition to borrowing, make up central issues in historical linguistics (Antilla 1972, 1977).

To make the discussion explicit, I want to restate some of the points that I have mentioned previously and to explain some points which are relevant to the explanation.

The changes that occur in a language can be mostly classified into two

⁸ It is not my intention to discuss the theories of analogy. I will limit myself to the effect of analogy on /f/ and /v/. For a comprehensive treatment of analogy, see Antilla (1977).

types.⁹ The first type takes place under conditions that may be stated phonemically. The second type occurs under conditions that cannot be stated in phonological terms, but that can be stated in terms of a morphological category or in terms of morphophonemic alternations. Traditionally, the first type is called sound change and the second type is called analogical change or, more specifically, analogical levelling¹⁰ (Hoenigswald 1960).

One can conclude from the previous discussion that a synchronic morphophonemic description of a language gives insight into historical processes which lead to that state of affairs. For example, a descriptive rule: $X \rightarrow Y / _ Z$, would exist as the result of a conditioned sound change. If records from an older stage (pre-sound change) were available, one could study the kind of relationships in terms of phonemic correspondences within morphemes that exist between an older stage and later stage of a given language. These could be classified into types of change which occurred during the interval between the two stages.

If we represent the older stage as (I) and the later stage as (II), a phonemic merger would appear as¹¹:

$$(1) \frac{I}{II} : \frac{x}{z} \frac{y}{z} = /x/ \text{ and } /y/ \text{ merge as } /z/.$$

A second possibility is that the merger is conditioned and that it operates only in certain environments. If environment (A) did not condition a sound change, but environment (B) did, it would be necessary to look at two sets of correspondences as is the case in the history of /f/ and /v/ in English:

	Stage		A/ __ Singular	B/ __ Plural
(2)	OE:	I	f	f
	ME:	II	f	v

/f/ remains /f/ in environment (A), but in environment (B):

⁹ Only changes which affect the /f/ and /v/ phonological status of English will be considered. For other types of historical changes, see any textbook on historical linguistics.

¹⁰ Different kinds of analogy have been recognized by historical linguists. Only levelling is relevant to this article. For other types of analogy, see Antilla (1972: Chapter 5), Jeffers and Lehiste (1977: Chapter 4), and Mahadin (1987: 173-183).

¹¹ The formulation of the figures is after Hoenigswald (1960).

f→v/___B as /f/ in *roof-roofs, wolf-wolfs, stiff-stiffs*, but as /v/ as in *wife-wives, knife-knives, shelf-shelves* (Hogg 1992: 282-289).

This is exactly the case in English. ME has phonologically conditioned alternating phonemes in certain morphs while OE has non-alternating phonemes in the relevant environment. There was an earlier stage in which both the singular and the plural forms of the morpheme meaning “wife” contained an /f/. A conditioned sound change is responsible for the morphophonemic alternations in ME represented by the forms *wife~wives*. This alternation is established as a regularity. In OE, the singular and the plural contained /f/. Hoenigswald calls this type of sound change as a secondary split¹² (Hoenigswald 1960: 93-94; Bynon 1977: Chapter 2), where the allophones of one phoneme become distinct (independent) phonemes without cancelling the phonetic difference between the allophones in question. The following figure shows the development:

Early Middle English	
/f/	
/f/[f]>/f/[f]	Modern English
/f/[v]>/v/[v]	/f/
	/v/

In early Middle English, [f] and [v] were in complementary distribution: [f] appeared word initially and finally, and [v] between vowels. The later loss of the final unstressed syllable resulted in many instances of /v/ occurring in word-final position and a contrast was established. This contrast has been one of the sources of phonemic status for /f/ and /v/ (see above discussion, examples and references cited).

However, other regularities occur. In the most interesting cases these will contradict a pattern like the ones established previously. Thus, where there is a rule like (2), there may, in addition, be a number of exceptions which as a whole constitute another rule. When this pattern comprises exceptions or non-applications of a morphophonemic rule, it represents a specific class of rules. For example, in English we have *wife~wives* (rule 2), but we also have *roof* and *roofs*. Rule (2) thus is contradicted by (3):

¹²See Hoenigswald (1960: 93-94). For more discussion and types of sound change, see Hoenigswald (1960), and Bynon (1977).

(3)	A/___ singular	B/___ plural
I	f	f
II	f	f

We expect a /v/ in /B/ to be the result of a conditioned sound change in the later stage, i. e., stage II, but instead there is an /f/. Furthermore, in a number of cases, there will exist doublets (two forms with approximately the same meaning). For example, *roof* has a second plural *rooves* which exists alongside *roofs*. And *rooves* seems to be the result of rule (2).

Two competing similar forms with the same meaning (doublets) reflect the rule relationship described above and have an excellent chance of analogical change. The phonemic correspondences will display this phenomenon. In the case of *roof*, *roofs*, and *rooves*, there will be correspondences like (2) and (3). There will also be cases of pairs of forms in which the form reflecting the original sound change shown in (2) will no longer exist. This is true of *cliff* and *cliffs*. Although the presence of doublets strengthens the case of analogical change in the original instance, once the pattern is established, a pair of forms like *cliff-cliffs*, which exhibits rule correspondences (3) in contradiction to the expected correspondences (2), will also mark these forms as the result of analogy.

Therefore, the pattern *cliff-cliffs* is recognized as affected by analogy because its singular and plural are like (A) where by rule (2) we expect the plural to be like (B). In other words, there is an /f/ in the environment in which one expects a /v/ on the basis of the pattern *wife-wives*, i.e. before the plural morpheme.

Also, if there are cases of the converse—that is, singular and plural like (B) where we expect the singular to be like (A)—again we probably have analogical change. For example, the pair *glove-gloves* displays correspondences as in (4) instead of (2).

(4)	A	B	
I	f/___ singular	f/___ plural:	OE
II	v/___ singular	v/___ plural:	ME

Thus, the pattern *glove-gloves* would be considered as resulting from an analogical process. One can conclude that analogical change may freely operate in either direction: *cliffs* for *clives*, but *glove* for *gluff* (from the plu-

ral *gloves*).

I am specifically dealing with the process known as analogical levelling by which irregularities in a grammatical paradigm are straightened out; that is, one allomorph of a morpheme type has been generalized to all contexts (similar forms). The recognition of morphs in this case is dependent upon the existence of morphs which appear to have undergone a sound change as described above. Analogically levelled morphs seem to be exceptions or contradictions to the result of sound change (Hoenigswald 1960: 30-32, 63).

As indicated above, OE medial and final (f) had a twofold origin and pronunciation:

- (1) Medially in combination with voiceless sound and finally, it was pronounced like Modern English (f) /f/ as in *roof*, *wife*, *wolf*, and *stiff*.
- (2) Medially between voiced sound, it was pronounced like the [v] sound in Modern English as in *wives* and *knives*.

So, these nouns should accordingly have /v/ when followed by the plural suffix (-es), but some of them retained the original /f/ on the basis of a model existing in the language, such as *roofs*, *wolfs*, and *stiffs*.

<u>OE</u>	<u>MidE</u>	<u>Modern English</u>
staf	staf	staff
staves	staves	staffs

(Nominative: sg. and pl.)

In the old paradigm of /staf/, the nominative singular has a closed syllable, but the first syllable is open in the plural and the /f/ > /v/ between two vowels. Also, in Middle English short vowels were changed to long ones in open syllables (Jones, 1989: 98-117). This affects the plural of *staf*, giving us *stāves*; with the Great Vowel Shift we get Modern English *staff/staves*. These changes resulted in etymological doublets (two different words in one language having an identical etymological source, but they are considered as two different forms denoting the same reference (see Hoenigswald 1960: 48-52). By the same token and parallel to *staff/staves* we have:

staff: staffs - due to analogical change.

x: staves, x=stave by back formation.

Also we have:

shelf-shelfs and shelve-shelves.
 cliff-cliffs and cleve-cleves.
 gluff-gluffs and glove-gloves
 shelves, cliffs, gluffs = analogical change
 shelve, cleve, glove = back formation

However, a few nouns still have the regular forms of the plural besides the new plurals as *scarves*, *wharves*, and *staves* beside *scarfs*, *wharfs*, and *staffs*, i. e., doublets with a difference in meaning (Hogg 1992: 282-284).

Moreover, the necessity of inspecting correspondences to recognize these phenomena, rather than working from internal evidence alone, becomes clear when one looks at a pair of forms which from internal evidence looks like the *cliff-cliffs* situation. For example, it is important to recognize that *cough-coughs* is not of the same category as *cliff-cliffs*. *Cough* has the phoneme /f/ in both environments A and B in the position where the alternation /f/~/v/ is expected. However, orthographic evidence indicates that *cough* once had an /x/ instead of an /f/ as its final phoneme. The loss of the velar /x/ is evident from 15th c. spelling; in other forms /h/→[x] is replaced by /f/; cf. *laugh*, *enough*, and *cough*. This indicates simply that an unconditioned sound change of the standard type has occurred and that analogy is not the cause. In the case of *cough*, then, the correspondences would look like this:

(5)	A	B	
	I	x	x OE
	II	f	f ME

(unconditioned sound change changed the allophone of /h/ which is [x] to /f/).¹³

It should be noted that, in some words, Middle English [x] has become [f] in Modern English; e.g., *laughen* [lauxən] > *laugh* [læf] or [la:f] and *tough* [tu:x] > *tough* [tʌf]. In other words, [x] has been lost in modern English as in Middle English *saugh* [sauX] > *saw* [sɔ:] (Moore and Marckwardt 1981: 139).

¹³The loss of velar [x] is evident from 15th c. spellings like *abought* "about", *ought* "out" *kawt* "caught" (Wyld 1953: 305). In some forms /h/ [x] is replaced by /f/; cf. *laugh*, *enough*, and *cough*.

It should be clear now that OE phonemes for *cliff-cliffs* match those for *wife-wives*, but those for *cough-coughs* do not.

Furthermore, another factor which disturbs the regular correspondences of sound change is borrowing. In other words, dialect borrowings are a further category of exceptions which can be formally isolated. These morphs occur only under conditions of non-alternation. In some cases, however, alternating phonemes may be involved. Doublets may exist, e.g. *fat* and *vat*, or near doublets *fox-vixen*, and yield correspondences as in (6): (for explanation of such forms, see section (3)).

		C	D
(6)	I	f	f
	II	f	v

But since the position of alternation is not that of rule (2), instead of analogy, dialect borrowing is suspected. In general, then, doublets which differ by at least one phoneme in the later stage, where the earlier stage had only one form (there was no phonemic difference) are an indication of dialect borrowing. Moreover, the later stage (stage II), which has a phonemic difference between /f/ and /v/, is not grammatically conditioned like that of *wife-wives*, and that there is no rule for forms which are considered as dialect borrowings; that is, there is no rule for getting from one form to the other which is morphologically or grammatically relevant. And since the older stage has /f/, not /v/, it would seem that *vat* and *vixen* are the borrowed forms (see section (3)).

It is important to keep in mind that forms like *wife-wives* are examples of what we could call a synchronic morphophonemic rule in ME, which gives an internal piece of evidence to the history of the language, and which is used in the method of internal reconstruction. The form of the rule is:

f → v / __ plural (Hoenigswaid 1960: 99-111).

That is, if one were to write a description of English noun morphology, such a rule could hardly be avoided because of the persistence of the /f/ ~ /v/ alternation: *leaf~leaves*, *shelf~shelves*, *knife~knives*, etc. Candidates of analogical change would appear then as exceptions to the rule.

5. Conclusion

The following table recapitulates the overall picture of the cases that we have discussed above (Rules: 2, 3, 4, 5, and 6 refer to the rules discussed above):

Rule	(2)	(3)	(4)	(5)	(6)
Linguistic Change	Conditioned sound change produces morphophonemic alternations in ME	Analogic change type(1) v/-plural f/-plural instead of the expected /v/	Analogic change type (2); the reverse of (3) ¹⁴ f/-singular becomes /v/ instead of the expected /f/	Unconditioned sound change: a phoneme or an allophone is developed to a different phoneme different from its proto-form	Borrowing results in doublets or near doublets
Environment	A/-singular B/-plural A:B	A/-singular B/-plural A:B	A/-singular B/-plural A:B	A/-singular B/-plural A:B	C/-singular D/-plural C:D
Earlier Stage OE(Stage I)	f:f	f:f	f:f	x:x	f:f
Later Stage ME(Stage II)	f:v	f:f	v:v	f:f	f:v
Example	<i>wife~wives</i> alternation produces a morphophonemic rule in synchronic grammar as a result or regular and automatic conditioned sound change [f]→[v]/-plural	<i>roof~roofs</i> pattern. /f/ of the plural from /v/ as the result of analogic change	<i>glove~gloves</i> pattern. /v/ of the singular from /f/ as the result of analogic change, but it is in the opposite direction of type (3).	<i>cough~coughs</i> pattern. [f] [f] the result of unconditioned sound change /h/ [x]→/f/ in the singular and the plural.	<i>fat~vat</i> pattern. /v/ is the result of dialect borrowing.

(see above discussion for other examples.)

As one can see from the previous discussion, the interplay between the two major diachronic processes, sound change and analogical change, is clear concerning their effect on the phonological and morphological patterns in the language.¹⁵ The two processes are said to be in a complementary distribution: sound change is regular and causes irregularity; analogy is irregular (not entirely predictable) and causes regularity. These two processes reflect the division of linguistic structure into two distinct levels: phonology and grammar (morphology in particular). Sound change is regular and automatic; it operates independently of grammatical and semantic structure. That is to say, it affects phonemes or sequences of phonemes regardless of their grammatical function, whether we are talking about conditioned or unconditioned sound change. On the other hand, analogical change is concerned with the relationship between phonological and grammatical structure and affects phonemes only in their role as elements of grammatical structure. Analogical change redistributes the co-allomorphs and brings about, in most cases, a substantial reduction in the number of stems exhibiting co-allomorphy. In the case of morphophonemic conditioning of sound change, we have a case of levelling analogy which levels out alternations to minimize allomorphy in the direction of a uniform morpheme realization which corresponds to one function or meaning as pointed out by Jeffers and Lehiste.¹⁶

As a consequence of such developments, linguistic relations apparently become more difficult to perceive and to learn. A need arises to bring greater uniformity to the forms and patterns of morphemes in order to facilitate perceiving and learning the formal relationships which obtain between them. Changes like levelling and analogy begin to operate to bring about this uniformity, and language continues to change in a cyclic fashion, alternating between the development and reduction of complexity.

Finally, the article traces the changes that have resulted in the contrast between /f/ and /v/ and the apparent exceptions to the sound change. The exceptions could be the result of analogy or dialect language borrowing.

¹⁴For more examples of rules 3 and 4, see Mahadin (1987: 173-183).

¹⁵For the interdependence of sound change and analogy, see Bynon (1977: 43-45) and Antilla (1972: Chapter 5).

¹⁶Jeffers and Lehiste (1979: 105). Antilla (1977: 55-58) calls this kind of tendency: one meaning-one form; also he discusses the different terms used to denote the same idea.

Also, the alternation between /f/ and /v/ has been explained.¹⁷

References

- Antilla, R. (1972) *An Introduction to Historical and Comparative Linguistics*, New York: MacMillan.
- Antilla, R. (1977) *Analogy*, The Hague: Mouton Publishers.
- Baugh, A. and T. Cable (1978) *A History of the English Language*, 3rd. ed., Englewood Cliffs, N. J.: Prentice-Hall, Inc.
- Bloomfield, L. (1933) *Language*, New York: Holt.
- Bynon, T. (1977) *Historical Linguistics*, Cambridge: Cambridge University Press.
- Dobson, E. J. (1968) *English Pronunciation (1500-1700)*, 2nd. ed., Oxford: Calrendon Press.
- Hjelmslev, L. (1947) 'Structural Analysis of Language' in *Studia Linguistica* 1: 69-78.
- Hjelmslev, L. (1961) *Prolegomena to a Theory of Language*, Translated by Francis Whitfield, Madison, Wisconsin.
- Hockett, C. F. (1958) *A Course in Modern Linguistics*, New York: MacMillan.
- Hockett, C. F. (1964) 'Graduality, Sporadicity, and the Minor Sound Change Processes' in *Phonetica* II, 202-215.
- Hockett, C. F. (1977) 'Intentions, Assumptions, and Contradictions in Historical Linguistics' in *Current Issues in Linguistic Theory*, 168-194, R. W. Cole (ed.), Bloomington: Indiana University Press.
- Hoenigswald, H. (1960) *Language Change and Linguistic Reconstruction*, Chicago: University of Chicago Press.
- Hogg, R. (1992) *A Grammar of Old English*, Vol. 1. Phonology, Oxford: Blackwell Publisher.

¹⁷Different hypotheses and explanations have been suggested to explain the cause of linguistic changes. It is not my aim to discuss them. One of the best works on this issue was carried out by Weinreich, Labov, and Herzog (1986) "Empirical Foundations for a Theory of Language Change." The conclusion of this article is: "Linguistic and social factors are closely interrelated in the development of language change. Explanations which are confined to one or the other aspect, no matter how well constructed, will fail to account for the rich body of regularities that can be observed in the empirical studies of language behaviour." (p. 188).

- Jeffers, R. and I. Lehiste (1979) *Principles and Methods for Historical Linguistics*, Massachusetts: MIT Press.
- Jones, C. (1989) *A History of English Phonology*, New York: Longman Inc.
- Lehman, W. P. (1973) *Historical Linguistics: An Introduction*, 2nd ed., New York: Holt.
- Lehman, P. and Y. Malkiel (eds). (1968) *Directions for Historical Linguistics*, Austin: University of Texas Press.
- Mahadin, R. (1987) 'Analogic Change', in *Language Sciences* 9.2, 173-183.
- Martinet, A. (1949) *Phonology as Functional Phonetics*, London.
- Moore, S. and A. Marckwardt (1981) *Historical Outlines of English Sounds and Inflections*, Ann Arbor, Michigan: George Wahr Publishing Company.
- The Oxford English Dictionary* (1933). London: Oxford University Press.
- The Oxford English Dictionary: A Supplement* (1972) London: Oxford University Press.
- Pyles, T. and J. Algeo (1982) *The Origins and Development of the English Language*, 3rd. ed., New York: Harcourt Brace Jovanovich, Inc.
- Weinreich, U., W. Labov, and M. Herzog (1968) 'Empirical Foundations for a Theory of Language Change' in Lehman, P. and Y. Malkiel (eds.) *Directions for Historical Linguistics*, 95-195.
- Williams, J. (1975) *Origins of the English Language*, New York: MacMillan.
- Wyld, H. C. (1953) *A Short History of English*, London.

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