

BLOOM-P-FIELD, CHOM-P-SKY, AND PHONETIC EPEN-T-THESIS

John G. Barnitz

- 0.0. Introduction
- 1.0. Epenthesis Defined
- 2.0. Diachronic and Synchronic Epenthesis
  - 2.1 Epenthesis Over Centuries
  - 2.2 Traditional vs Generative Historical Linguistics
  - 2.3 Articulatory Bases for Epenthesis
  - 2.4 An Experiment in Synchronic Epenthesis
- 3.0. Conclusion

0.0.

A frying pan company's advertising campaign included glaring store displays with the lettering: "HOT PANS." Everyone has heard stories of an ugly duckling or a handsome prince; but, Kodak in one television commercial told the story of "the ugly film cartridge and the handsome prints." These puns from Madison Avenue are significant to the study of speech sounds in transition, particularly the phenomenon of phonetic epenthesis. Why does /pnts/ sound like /panz/? Why does /prns/ become [prnts]? Where is epenthesis most likely to take place? This study will explore phenomena of synchronic and diachronic epenthesis in order to discover some phonetic facts behind it.

1.0.

Before we proceed with the main discussion, it is necessary to define epenthesis both in the traditional sense and in the generative phonological sense. Excremental sounds are any additional segments resulting from a rephrasing of articulation. Traditional epenthesis refers to the process of adding to a word a non-phonemic consonant (in most cases a stop). This is a synchronic phenomenon which often gives rise to a diachronic epenthesis, where the phonetic excremental consonant becomes phonemic. Thus, the pronunciations of Chomsky/Chompsky illustrates synchronic epenthesis, while the change O. E. [θymle] > Mod. E. thimble illustrates diachronic epenthesis.

The other type of excremental sound is anaptyxis defined by Bloomfield (1933:

384) as "the rise of a vowel beside a sonant, which becomes non syllabic." Anaptyxis occurs diachronically in the change: P.I.E. \*[agros] 'field' > pre-Latin \*[agr] > Latin [ager]. Another example is Latin schola (scola) 'school' becoming French école, Portuguese escola, and Spanish escuela. Anaptyxis occurs synchronically in film [fɪləm], elm [ɛləm], Henry [hɛnəri], and athlete [æθlɪt]. The scope of this paper will not include an explanation for anaptyxis.

While epenthesis in traditional linguistics applies only to consonants, the term in generative linguistics refers to both consonants and vowels. Phonological epenthesis is claimed to be an abrupt insertion of a segment. Thus a rule of epenthesis will account for (but not explain why there is) the phonological alternation in the following data from Yawelmani (Kenstowicz et al., Chap. 4).

paʔt̚ - al	'might fight'	paʔit̚ - hin	'fights'
?ilk - al	'might sing'	?ilik - hin	'sings'
logw - al	'might pulverize'	logiw - hin	'pulverizes'

Assuming CVCC- as the base form, the epenthesis rule will insert an [i] to break up the consonant cluster:

$$\emptyset \rightarrow i / C \_ CC$$

This paper will not deal with epenthesis within the framework of generative phonology. I am concerned here with the phonetic facts which "underlie" any phonological rules. (See Guile 1971 and 1972 for details of phonological epenthesis). I am also limiting this study to epenthetic stops, the most common excrescent consonants. (For a discussion of epenthetic glides, see Heffner 1950.)

2.0.

We can discuss the process of phonetic epenthesis in a twofold manner. First, we will examine historical sound changes most of which introduced homorganic stops. Secondly, we will examine synchronic epenthetic processes. A comparison of diachronic and synchronic epenthesis will provide support to the hypothesis that epenthetic homorganic stops will (in most cases)

break up nasal-liquid and nasal-fricative consonant clusters, phonetically unstable clusters in language.

### 2.1.

Examples of historical developments of nasal-liquid clusters are plentiful. An epenthetic homorganic stop arose between a nasal and [l] in many cases. Old English br̄emel and br̄æmbel were in free variation. The latter form was acquired by later generations yielding Modern English bramble. The same occurred with O. E. [θymle] which became Modern English thimble. Latin humilem became English humble, creating the alternation humble ~ humility. Several other "ble" words in English received the epenthetic stop before being borrowed into English. Indo-European \*tem-lo-m became Latin templum which became English temple. Likewise Indo-European \*eks-em-lo-m changed to Latin exemplum which became English example. In these cases the excrescent stop was bilabial because of the point of articulation of the preceding nasal [m]. However, an alveolar stop will intervene between an alveolar nasal and [l] in O. E. spinel > spindle. I would also suspect that an excrescent velar stop will intervene between a velar nasal and a liquid, although I have no examples (hypothetically/ bloŋli > [bloŋkli]): but, this would not occur in early English, since Old English had no velar nasal phoneme.

Likewise, the articulation of nasal + [r] has often resulted in the appearance of an epenthetic stop. The sequence [mr] became [mbr] in English timber which is traceable to a free variation in Gothic between [timrjan]/[timbrjan]. The latter became Old English timbrian which is cognate with German zimmer. (Why no excrescent [b] became phonemic in German, I am not sure; although, I would suspect that German speakers will occasionally epenthesise on a synchronic phonetic level and will of course not be consciously aware of it.) Another case of the sound change [mr] > [mbr] is P.I.E. \*a-mrot-os > Greek ambrotos 'immortal'. English borrowed the word encumber from French already with the epenthesis.

There are many cases of the sound change [nr] > [ndr]. Old English had

the forms ganra and gandra in free variation, the latter becoming Modern English gander. Likewise, Modern English thunder came from O. E. [θunrian] which had as a variant [θundrian]. Similarly, Indo-European \*anr-os became Græek andros 'man', and Latin allegro ten(e)re became French tendre. I have no examples of a sound change [ŋr] > [ŋgr], although it is theoretically possible in Modern English. There were no phonemic examples of /ŋ{<sub>r</sub>}<sup>1</sup>/ > /ŋg{<sub>r</sub>}<sup>1</sup>/ because Old English had no velar nasal phoneme.

Aside from nasal-liquid clusters, there are many cases of diachronic epenthesis between nasal-fricative clusters. Examples of the change [ms] > [mps] include the proper names Thompson and Sampson. The sequence [mʃ] became [mpʃ] in the case of Hampshire. The sequence [ns] became [nts] in English varmint (perhaps < vermin / \_\_\_\_\_ s); but the sequence [nz] became [ndz] in the derivation: O. F. son > M. E. soun > sound / \_\_\_\_\_ z. Perhaps the excrement stops in sound and varmint originally appeared in the plural forms; the stop then being transferred to the singular form by analogy in the paradigm back formation. In all of these examples, the stop is homorganic with the preceding nasal and also receives the feature of voicing from the following fricative. I would expect to find examples of epenthesis between [nθ], [nð], [nz], [mθ], [mz], but I do not have any examples of these as a diachronic phenomenon. However, the change [nz] > [ndz] would probably not be found in English since Old English did not have a /z/ phoneme.

Although nasal-liquid and nasal-fricative clusters are the most susceptible to epenthesis, there are other environments where epenthesis has occurred. The cluster nasal - stop in empty and exempt were broken up in these two examples:

I. E. ex - ēmere > Latin exemptus > English exempt

O. E. æmtig > Mod. English empty.

The cluster liquid-liquid was broken up here:

O. E. [alre] > Mod. Eng. alder

A major sound change of epenthesis in Indo-European is [sr] > [str].

Where Indo European has \*[sr], Germanic and Slavic have [str]. Thus proto Indo European \*srow- (stream) changed to: primitive Germanic [strawmaz], Old Norse [strawmr], Old English [stre:am], and Old Bulgarian [struja] (Bloomfield 1933: 384). This epenthesis is particularly interesting because it suggests to us the fact that when consonant clusters (when borrowed) are not admissible to sequential rules of morpheme structure, the cluster will be broken up to fit the sound pattern of the particular language. For example, hypothetical [srɪk] could undergo a change when borrowed into English to become [strɪk].

We may so far conclude that epenthesis of homorganic stops follow similar patterns across languages. Epenthesis will break up unstable consonant clusters of any language. Thus, these clusters are the most susceptible to sound change.

## 2.2.

The crucial question to raise is WHY? How can we explain these sound changes? Are they brought about by a change in the grammar, i.e. a change in the native speaker's competence resulting from the addition of a phonological rule? Or is epenthesis the result of his performance, i.e. a rephrasing of articulation? These questions can be sufficiently answered in a very theoretical way by mentioning the differences between traditional and generative approaches to sound change.

The traditional view (Bloomfield, Hockett) claims that change is a gradual process and is therefore imperceptible to the speakers of the same generation. Not only is sound change gradual, but it is ever progressing; no two performances of the same utterance are the same. In other words, sound change is a change in performance, not competence. (However, the performance of one generation might become the competence of the next generation as variant forms are acquired by children, who construct their own grammar on one of the alternants in free variation.)

Directly opposing this view of sound change is the generative approach (King 1969, Postal 1968). It is maintained that language change is not a

change in performance, but a change in competence. The role of performance then is insignificant to the change; it did not cause the change in grammar. Generativists also claim that language change is not gradual, but is abrupt. In other words, a sound is said to be inserted, deleted, transposed, or shifted in an abrupt fashion through the application, loss, or reordering of phonological rules. King (1969: 109) argues: "There is the indisputable existence of cases such as loss, metathesis, and epenthesis in which any kind of gradual process strains the imaginative faculties as well as the set of distinctive features that one assumes to be universal." Unfortunately, King's theory will fail to give a complete account of phonetic "facts" behind epenthesis. (Later in this paper I will suggest the notion of "degrees of epenthesis," suggesting the possibility that diachronic epenthesis is not an abrupt process or an "insertion.") The historical generativists would consider epenthesis as an "insertion," which would fail to explain why Slavic slověne and Greek Σχλαβῆνοι are related to each other. But Maher (1970: 32) explains:

In pronouncing slověne, Slavs felt they were saying and hearing an g followed by an l; no other segments of features were noted on the Slavic side. But on the Greek side, a different impression was had of the same phonetic material. In the Slavic (and modern English) cluster the l is voiceless in its onset; this l is made with an audible click made by the sides of the tongue breaking away from the molars when the tongue jumps from g-position to l-position. Greek had no cluster which its speakers analyzed as sl, but did have several phonetically similar clusters: skl, sθl, stl, which like the Slavic sl present a voiceless allophone of l. The phonetic click which the Slavs made but did not "hear," that is to say was not phonemic or distinctive, but was a redundant feature of post-g environment, was interpreted by the Greeks . . . as their kappa.

Thus, the real story of why epenthesis occurs lies not in generative phonology, but in articulatory phonetics.

### 2.3.

Let us examine the articulatory bases for several historical examples discussed above. We have seen that when two sounds are contiguous, quite

often there will be a transitional segment occurring between them. This is especially true if there is an asynchronism in the articulation of one of them (Heffner, 1950: 185). Consider English timber < O. E. timbrjan < Gothic [timrjan]~[timbrjan]. In the transition between [m] and [r], the articulatory movements must include both the raising of the velum and the simultaneous movement of the tongue from the neutral position during the closure for [m] to the trill position of [r]. The differences between the Gothic variants is the timing of these muscular movements. In the case of [timrjan], the movements are simultaneous; but, in the case of [timbrjan] the movements are out of phase. If the velum is raised before the movement of the tongue, there will be a moment of oral occlusion, phonetically a stop. The stop will be homorganic with the preceding nasal since the point of closure is the same as the nasal during the raising of the velum. Furthermore, the stop will be voiced because the vocal folds do not stop vibrating in the transition between the two voiced consonants. The transition between [m] and [r] is summarized in the following diagrams:

simultaneous movements

	[m]	→	[r]
velum:	lowered	→	raised
lips:	closed	→	open
tongue:	down	→	up
glottis:	voicing	→	voicing

asynchronous movements

	[m]	→	[b]	→	[r]
lowered	→	raised	→		
closed	→	→	→	open	
down	→	→	→	up	
voicing	→	→	→	voicing	

The same description can be given to O. E. spinel > Mod. Eng. spindle:

simultaneous movements

	[n]	→	[l]
velum:	down	→	up
teeth:	closed	→	open
tongue:	down	→	up
glottis:	voicing	→	voicing

asynchronous movements

	[n]	→	[d]	→	[l]
down	→	up	→	→	
closed	→	→	→	open	
down	→	up	→	→	
voicing	→	→	→	voicing	

Antilla (1972: 69) lists cases from West Lapp of the reverse process where a homorganic stop occurs in front of a nasal. This is caused by the delayed lowering of the velum, the nasal segment starting before the complete lowering of the velum. Thus \*ruma > robme 'ugly', \*sone > suodna 'vein', and \*poŋe > buoŋa 'bosom'.

In the cases of nasal - fricative consonant clusters, epenthesis can be represented in the same type of diagram. Consider [tamson] vs [tampson].

simultaneous movements

	[m]	->	[s]
velum:	down	->	up
lips:	closed	->	open
tongue:	low	->	high
glottis:	voice	->	voiceless

asynchronous movements

	[m]		[p]		[s]
velum:	down	->	up		
lips:	closed	----->	open	----->	
tongue:	low	----->	high		
glottis:	voice	->	voiceless	->	

These examples were composed of nasal-liquid and nasal-fricative clusters. But, what happens in the case of nasal-stop clusters as empty? This could have occurred by the premature release of the bilabial occlusion and the raising of the velum before the movement of the tongue for [t].

This discussion has provided a phonetic explanation of epenthesis, the result of nonsynchronous articulatory movements in transition between one sound to the next. Thus, it seems simplistic to describe epenthesis only as an insertion by rule as the generativists claim to be the case.

#### 2.4.

The focus of our attention now turns to the topic of synchronic epenthesis in order to see that the same clusters involved in diachronic epenthesis are susceptible to synchronic epenthesis. Data for this discussion is taken from a simple experiment. I first collected examples of words where I most expected epenthesis to occur. All the examples contained the same clusters that permitted diachronic epenthesis. The corpus of words was then mixed into a script from which four English informants read into a tape recorder. The tape was then analyzed at both normal and slower speeds in order to discover any abruptness in the transition between sounds. The experiment revealed that not all the subjects epenthesized the same words, suggesting the "free-variation-ness" of epenthesis, and that all the informants epenthesized in environments that had resulted in the sound changes discussed above. Let us examine two sets of data: the first is divided into three subsets according to whether the excrescent

sound is bilabial, alveolar, or velar; the second consists of minimal pairs.

## 2.41

Bilabial excrescence

As was expected an excrescent [p] was heard in transition between a bilabial nasal and fricative. Examples are plentiful: "I am from(p) Chicago," "com(p)fort and warm(p)th," "I'm(p)sipping," "Seventh Sym(p)phony of Chom(p)skey." However, in the cases of assumption and empty, the excrescence is less prominent synchronically. Although speakers often give these a spelling pronunciation when reading a script, more often than not (especially not in lento speech) epenthesis is weak. A possible explanation might be, at least in the case of empty, that the sequence [pt] is less susceptible to discrimination because of their joint, not separate, release of the closure after [m]. This is only a speculation since the sequence [pt] does occur in such words as apt, wept, captain, etc. in full force.

Examples of an excrescent [b] occurred in items [aitəmbz], drums [drʌmbz] and "My name is Judy Williams" [Wɪljəmbz].

Alveolar Excrescence

Alveolar excrescence is the most common. All speakers would epenthesize between [n] and [s]. Examples include:

circumstance	[sərkəmstənts]	chances	[tʃəntʃəz]
conscience	[kənʃjənts]	tense	[tɛnts]
performance	[pəfɔrmənts]	mince	[mɪnts]
transparency	[trænzpərəntsi]	dense	[dents]
Spenser	[spɛntsər]	prince	[prɪnts]

But the word constitution does not become [kənstɪtʃən] because English forbids [tst] clusters at the beginning of a syllable.

The sequence [nʃ] was broken by a stop in the following cases:

conscience	[kəntʃjənts]	pension	[pɛntʃən]
in Chicago	[ɪntʃɪkəgo]	expansion	[ɛkspɛntʃən]

The sequence [n] [θ] is exemplified by seventh [sevəntθ]. But not all speakers will produce a [t], because they have an alternative way of

breaking the cluster (dialectal?): they may reduce the nasal before the fricative to yield [sevæθ]. A native from Fort Myers, Florida, who epenthesised more than the other informants, would even reduce the nasal to something like a glottal stop in monster [maʔstər] (not [mantstər]) and in conscience [kaʔʃjəns]. I cannot provide an explanation for this.)

#### Velar Excrescence

The only cases of velar excrescence are kingfish [kiŋkfiʃ] and sing Chicago [siŋkʃikago], and alongside [əlɔŋksaid].

-----

Beside the examples of nasal-fricative clusters, there should be cases of nasal-liquid clusters. However, I suspect synchronic epenthesis in this environment will be less common in the speech of educated persons. There may not be a full segmental "intrusion" as in many of the nasal-fricative examples. I could not detect an epenthesis from any of my informants' pronunciations of grimly, although grimbly is a social dialectal variant (c.f. chimbly, fambly for chimney and family). However, in the case of one speaker's allegro pronunciation of the nonsense word thunner; it sounded very close, but not identical to his pronunciation of thunder [θʌndr].

2.42.

Before we conclude the discussion on synchronic epenthesis it is important to consider some sets of minimal pairs. Consider the following pairs with an epenthetic stop included where expected:

the Chicago Cubs	tell him Chicago	in Chicago
[ðə ʃikago kʌbz]	[tɛl hɪmp ʃikago]	[ɪntʃikago]

More often than not in allegro speech, there will be an epenthetic stop before the beginning fricative of Chicago. None of my subjects epenthesized in "the Chicago Cubs" because there is no preceding nasal consonant. However, in "tell him Chicago," there may be an epenthesis but it doesn't seem to be fully segmental. At times it was difficult to hear the epenthesis until I played the tape at half-speed. It may be that the [p] could not be fully segmental because English doesn't allow word initial [pʃ]. But in the case of "in Chicago," the epenthesis is quite obvious in everyone's

speech. I became especially aware of this when someone asked me why I say [tʃɪkəgo] instead of [ʃɪkago]. Ignoring the Chicago dialectal variation in the vowel, the fact is that I only say [tʃ] when it is preceded by an [n]. Thus, the pronunciation is not the result of a sound substitution, but rather the result of an epenthesis. (However no epenthesis will occur in a lento pronunciation: ɪn - (pause) - Chicago.)

Next consider these data:

I'm sipping	in sipping
I'm slipping	in slipping.

My informants would epenthesise slightly in the first row [aim<sup>p</sup>sɪpɪŋ], [ɪn<sup>t</sup>sɪpɪŋ], but not at all in the second row. A possible explanation for this distribution is that in the latter a full epenthesis will create an oversize syllabic structure with a medial four-consonant cluster, while in the former it wouldn't be the case.

Now consider the minimal pair:

Tell him to sing "Chicago" (the song).  
 Tell him to sink Chicago's largest boat.

In the former there is a cluster [ŋʃ] which is available for epenthesis. One speaker only slightly epenthesized a [k] ([sɪŋ<sup>k</sup>ʃɪkago]), still keeping the [ŋkʃ] cluster distinct from sink Chicago's [sɪŋk ʃɪkagoz]. However another speaker epenthesized a full segment in sing Chicago making it nondistinct (to me) from sink Chicago's.

Finally consider the pair Spainser [speɪnsər] vs. Spanser [spænsər]. The experiment yielded different degrees of epenthesis. There was little or no epenthesis in the former, while there was epenthetic [ɪ] in the latter. Again, a syllable structure may have been involved in this discriminatory epenthesis. The former contains a long vowel (a diphthong), and an epenthetic segment may disrupt the syllabic balance or make the syllable overly long.

An acoustic analysis of all these examples might provide evidence to the notion of degrees of epenthesis. Why would one speaker produce more of a segment than another speaker? Why in the same phonetic environment

will there be a variation of epenthesis or nonepenthesis even by the same speaker? These are unanswered questions. This perhaps suggests that epenthetic change is not an abrupt process as the generativists claim it to be.

### 3.0.

This paper was set out to survey and discover phonetic facts behind the phenomenon of historical and synchronic epenthesis. It has shown that: (1) homorganic stops will break up nasal-liquid and nasal-fricative clusters, if the new sequence does not create an overlong syllable; (2) diachronic epenthesis is not necessarily the result of the addition of a phonological rule to the grammar (i.e. a change in the competence of a speaker), but it is the effect of performance (i.e. asynchronism of articulation); and, (3) phonology without phonetics fails to give the full colored picture (the handsome prints) of epenthesis.

### FOOTNOTES

<sup>1</sup> Examples of historical changes were collected from introductory books on historical linguistics. See bibliography.

### BIBLIOGRAPHY

- Algeo, John and Thomas Pyles (1966). Problems in the Origins and Development of the English Language, New York, Harcourt, Brace, & World, Inc.
- Anttila, Raimo (1972). An Introduction to Historical and Comparative Linguistics, The Macmillan Company, New York.
- Arlotto, Anthony (1972). Introduction to Historical Linguistics, New York, Houghton Mifflin Co.
- Bloomfield, Leonard (1933), Language, London, George Allen & Unwin LTD., 1970.
- Chomsky, Noam and Morris Halle (1968). The Sound Pattern of English, New York, Harper & Row Inc.
- Daly, D. M. and L. W. Martin (1972). "Epenthetic Processes," Papers in Linguistics (5:604-613).

- Guile, Timothy (1971). "Toward a Theory of Phonological Epenthesis," unpublished m.s.
- \_\_\_\_\_ (1972). "A Generalization About Epenthesis and Syncope," Papers from the Eighth Regional Meeting of the Chicago Linguistics Society, April, 1972, pp. 463-469.
- Heffner, R. M. S. (1950). General Phonetics, Madison, Wisconsin, The University of Wisconsin Press, 1964.
- Kenstowicz, M., C-W. Kim, and C. Kisseberth, University of Illinois, Introduction to Phonological Structure (forthcoming).
- King, Robert D. (1969). Historical Linguistics and Generative Grammar, Englewood Cliffs, New Jersey, Prentice Hall, Inc.
- Lehmann, Winfred P. (1962). Historical Linguistics, New York, Holt.
- Maher, John P. (1969). "The Paradox of Creation and Tradition in Grammar: Sound Pattern of a Palimpsest," Language Sciences, 7, 15-24 (Oct).
- \_\_\_\_\_, (1970) "The Etymology of Common Slavic Slovène 'Slavs'" Académie Bulgare Des Sciences: Linguistique Balkanique, XIV, 2, 31-6; A revision will appear in Journal of Indo-European Studies.
- Postal, Paul (1968). Aspects of Phonological Theory, New York, Harper & Row.
- Sturtevant, Edgar (1917). Linguistic Change, Chicago, University of Chicago Press.