

XXIII. LINGUISTICS*

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A. FRENCH TRUNCATION RULE

In a previous paper¹ we proposed a solution to a difficulty encountered in Schane's account of French Truncation,² namely differences in behavior among words beginning with glides: le yogi vs l'yeuse, le watt vs l'ouate. We thought that this irregularity could be explained as follows.

1. Words that do not entail truncation of the preceding vowel begin with an underlying glide, others with an underlying vowel.

2. A rule /iüu/ → [yqw]/_____ V follows the Truncation rule. (That such a Gliding rule seems to be needed anyhow was also recognized by Schane,³ but no connection with Truncation⁴ was perceived.)

The question of order is obviously crucial; if the Truncation rule had to follow the Gliding rule, our proposal would be hopeless. Indeed such an objection has been raised by Halle⁵: Truncation applies cyclically not only below word level (for instance, between article and noun, pronoun and verb) but also above word level (for instance, between adjective and noun, verb and complement); therefore, Gliding, being a word-level non-cyclic rule, would precede at least some applications of the Truncation rule.

Professor Halle's objection relies on three assumptions:

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1. A theoretical hypothesis, that all noncyclic rules can be considered as word-level rules in such a way that (a) there is no noncyclic rule that applies above word level (that is, across true word boundaries),⁶ and (b) no noncyclic rule can operate after a cyclic one applying above word level.

2. The cyclic character of Truncation.

3. The assumption that the boundaries inserted by the syntactic component define in a satisfactory way the environments for Truncation (in which case only, a noun and modifying adjective, for instance, have to be two different "true words").

To answer the objection, it would be sufficient to show that one of these assumptions can be contested. We do not intend to discuss the first one, indeed we accept it as our framework; we shall discuss the two others and try to show that both of them can be disputed.

1. Some Contradictions between Assumptions 1 and 3.

If we admit that no underlying nasal vowels exist in French, a Nasalization rule is needed, or rather two rules, which are independent in some cases (cf. Schane⁷; we add that some southern French dialects have (a) but not (b)):

$$(a) \quad V \longrightarrow \tilde{V} / \text{---} N \left\{ \begin{array}{c} C \\ \#\# \end{array} \right\}$$

$$(b) \quad N \longrightarrow \emptyset / V \text{---} \left\{ \begin{array}{c} C \\ \#\# \end{array} \right\}$$

Cf. /grand/ \longrightarrow /grãd/ ; /bon/ \longrightarrow /bõ/.

This can be a cyclic or a noncyclic rule. Let us assume that it is noncyclic. Now, in the phrase le bon ami clearly the rule cannot have applied, although bon is a true word, since we have /le bon ami/ vs /le bõ livre/. The fact is that the vowel in ami becomes part of the environment and prevents the application of the rule, so that here we would have a noncyclic rule that applies to something "larger" than the true word, which contradicts the first part of assumption 1.⁸

That there is a correlation between this rule and the facts of gliding is shown by the fact that Nasalization must apply before consonants and those glides that the Truncation rule treats as consonants: cf. /un bõ Yougoslave/ vs /un bon hiatus/ ([œ bõ nyatüs]). It might thus be expected that the Gliding rule, too, can be conditioned by an environment belonging to a separate word. This is indeed the case: it is well known that Gliding depends on the nature of the preceding cluster: if this is too heavy (for instance, consonant+liquid) the rule cannot apply, cf. troisième with [y] vs quatrième with [i], relier with [y] vs templier with [i]. But this restriction holds also across true word boundaries: cf. un terrible hiatus with [i] vs l'hiatus with [y]; une faible ouïe with [u] vs l'ouïe with [w]; on the contrary, in un admirable whisky it never happens that the

/w/ becomes [u], and that is precisely what is expected (in fact, the final /e/ in the adjective does not truncate before such a glide, so that the conditions are not met).⁹

Consequently, we have another case in which a rule, which we considered as non-cyclic, applies to something that is seemingly larger than the word; moreover, this rule must obviously follow the Truncation rule (since if the final /e/ in faible had not dropped, the initial /u/ in ouïe could freely go to [w]) and that contradicts the second part of assumption 1.

In view of these facts, there are only two possibilities:

1. Reject assumption 1 and allow noncyclic rules to apply above word level and in certain cases to follow cyclic rules.

2. Reject assumption 3 by modifying the syntactic boundaries in such a way as to keep the groups Adjective + Noun, Verb + Noun within the word level.

Now the first possibility has all of the characteristics of an ad hoc solution, since it modifies a whole theory in order to account for isolated facts. On the contrary, to say that the second solution is equally ad hoc, since it amounts to readjusting a boundary every time liaison occurs, would not be justified; by doing so we do not add anything new to theory, but rather make use of a flexible device that the theory provides. Moreover, this device is independently needed, as Schane recognized, even though his approach was totally different; there are, he points out,¹⁰ optional liaisons, for instance, des camarades-z-anglais vs des camarad(es) anglais. This fact proves that, whatever the general theory of Truncation should be, it must allow for an optional readjustment of the boundaries. Schane, considering that liaison occurs across true word boundaries, had to explain its occasional non-occurrence by positing between adjective and noun an element preventing it and involving the deletion of the preceding consonant, the "phrase boundary";¹¹ on the contrary, what is required in our approach is to explain why it occurs, namely by optionally reducing the true word boundary.¹²

What we have is a true word that consists of a group of lexical items, which corresponds sometimes rather closely to the entity needed for stress placement ("mot phonétique") and also to what is called "unité de sens," so that our proposal, though purely phonological, seems to capture a notion that has independent motivations. Instead of being divided into two parts by word-level rules, the rule for Truncation would simply apply inside the limits of the true word as defined by readjustment rules; if it is cyclic, the current theory makes it precede any word-level noncyclic rule, and particularly the Gliding rule.

The preceding argument is not of itself conclusive, since we have simply assumed that Nasalization and Gliding are noncyclic, which is an unsupported hypothesis. As Halle pointed out to us, our examples could be taken to show, on the contrary, that these rules are cyclic. In this case, obviously, our arguments supporting a readjustment device would be devoid of significance. (The correct results could still be obtained by

ordering the 3 rules in such a way that in each cycle Truncation would precede Gliding and Gliding would follow Nasalization.)

But all that our examples show, in fact, is that the 3 rules apply in the same way, without determining unambiguously in which way. They do not show that the rules have to be cyclic. They show a close relationship between the rules, which makes it necessary to consider all of them as cyclic, if one of them is recognized as being such. Consequently, the discussion of assumption 2 is quite crucial for our proposal: If Truncation is cyclic, the other rules are cyclic, too, and no readjustment device is needed; if, on the other hand, assumption 2 is rejected, none of the 3 rules is cyclic, and our arguments supporting a readjustment device are confirmed.

2. Is Assumption 2 Unassailable?

Schane has claimed that the Truncation rule should be cyclic, although the facts can be almost completely accounted for without cycles. Actually, the demonstration supporting this claim relies on a single fact only (as far as we can see, the only one that can be used for this purpose).

The argument is the following. Given the rules

1. (a) $V \rightarrow \emptyset / \text{---} \left\{ \begin{matrix} + \\ (\#) \# \end{matrix} \right\} V$
- (b) $C \rightarrow \emptyset / \text{---} \left\{ \begin{matrix} + \\ (\#) \# \end{matrix} \right\} C$
2. $C \rightarrow \emptyset / \text{---} \# \$$

and the phrase des camarades anglais without liaison (that is, with a \$ between camarades and anglais), it is impossible to obtain the correct result without cycles.

Let us adopt the order 1, 2 and the representation

déS # camarade + S# \$ # anglais + S# \$

By 1, S $\rightarrow \emptyset$ in des, z $\rightarrow \emptyset$ in anglais.

By 2, S $\rightarrow \emptyset$ in camarades and anglais.

The result is *"dé camarade anglai," without the required dropping of the final [ə] in camarades.

If the reverse order (2, 1) is adopted:

By 2, S $\rightarrow \emptyset$ in camarades and anglais.

By 1, S $\rightarrow \emptyset$ in des.

But then there is no way to delete the final /z/ of anglais, as would be necessary.^{13, 14}

As Schane says: "Truncation between morphemes must precede Final [Consonant] Deletion; Final Deletion has to precede truncation between words."¹⁵ This of course would be a strong motivation for a cycle. Indeed with a cyclic rule the difficulty can be solved if the order of rules is 1, 2 and if a further convention is added specifying that whenever a right bracket is erased, a preceding \$ is also erased. In this way, the last cycle will not contain any \$ that could prevent the truncation of the final [ə] in camarade.

Yet this explanation has something contradictory about it: a previous readjustment rule has introduced a \$ in order to prevent the liaison of the consonant with a following vowel, but it is to the following vowel that the [ə] dropping is attributed. The principle of explanation being contradictory, it is not surprising that it implies a contradiction in the procedure, namely the successive introduction and deletion of a specific kind of boundary. Even if a new element should be introduced (and that would not be necessary in our proposal), it would be more satisfactory to account for both facts, [ə] and plural formative dropping, in the same way, namely by the presence of this element.

This supposes, of course, that some device exists for dropping [ə] in final position; and indeed such a device is needed if Standard French is to be described adequately, the crucial fact being here that poetry never counts as a foot an [ə] at the end of a line. The claim that such a Final Schwa Dropping may not be considered in a general French phonology is motivated for Schane by the existence of dialects that do not present this rule. But this confuses two things: the dropping of [ə] that transforms /petite/, /table/ into [pət̪it], [tabl] in final position, and the dropping of [ə] that occurs, for instance, in je ne le demande pas (pronounced [ʒə n lə dmɑ̃d pa]). Yet the two phenomena of dropping should be sharply kept apart:

1. The first one occurs only in final position, before a strong boundary; the second affects all [ə] in every position inside an "unité de sens" (for instance, in the initial syllable in demande).

2. The first one is not conditioned in any way by the preceding environment; the second is possible only if the [ə] is not preceded by more than one consonant (cf. Delattre¹⁶).

3. The first one is obligatory in Northern French dialects and in poetry (which provides the crucial test, since it is based on the number of syllabic elements in a line), so that it is simply not true to say, as Schane does, that "in the type of style where the schwas are pronounced, the schwas must either be followed by a consonant or else appear in utterance final position".¹⁷ On the contrary, the second dropping is forbidden in poetry, and even in the dialects in which it occurs it is never constantly obligatory.¹⁸

Consequently, whereas it can be legitimate to consider the second phenomenon as too specific to be included in a general theory of Standard French, it is a distortion of the facts not to take the first one into account. For this purpose, we need a sort of counterpart of the Final Consonant Deletion rule, which will send /petite/ to [pət̪it]

before #\\$ (or also true word boundary in our framework). That this rule is different from the rule for consonants, however, is shown by the fact that it concerns only one vowel, namely the "mute" [ə], whereas the other concerns all true consonants; indeed in every notational system that will have common features for consonants and vowels, there will be no convenient way to collapse these two rules. But if they are independent, their order is uniquely determined: if /petite/ goes to [pətit] before the Final Consonant Deletion, there will be no way of preventing what is now /petit/ from going to [pəti] like the masculine. Consequently, Final Consonant Deletion must precede Final Schwa Deletion, but if this order holds, it is now very easy to get /kamarad/ before #\\$ after the deletion of final /S/ in the same environment, and it suffices for the example discussed previously to adopt the order Truncation; Final Consonant Deletion; Final Schwa Deletion, to obtain the desired result.

But if this is true, there is no conclusive argument showing that the Truncation rule must be cyclic: The impossibility pointed out by Schane appeared as such only because he failed to state a rule that is nevertheless needed for any accurate description of French. And, indeed, from a theoretical point of view, this noncyclic character of Truncation should not be wholly unexpected; it seems very likely now that cyclic rules should be confined to "prosodic" facts (intonation, stress, etc.), which usually operate over units larger than the word. But the facts of truncation are clearly not prosodic in this sense, since they deal with deletion of segments in certain environments. Now, by the same token, the noncyclic character of Gliding and Nasalization is confirmed. Consequently, we can maintain and complete our proposal: not only must Truncation be constrained not to apply above word level, but it must also be considered as being properly a word-level rule; thus, we have 3 rules applying noncyclically at the word level as defined by readjustment rules.

Our conception can be tested in a language that ought to be considered crucial for any analysis of Truncation – Sanskrit. As it has always been recognized, Sanskrit Sandhi is but a set of liaison rules, only much more extensive, more consistent, and therefore easier to observe than in French. Now it is a fact that Sandhi has always been adequately accounted for without cycles, and this alone should be viewed as a strong argument in favor of our claim that the need for cyclic rules in French follows only from incomplete observation. But there are also other analogies between the two phenomena that cannot be due to chance: in fact, the necessity for boundary readjustments can be shown for Sanskrit in the same way as for French. Two examples will suffice.

1. There must be a (word-level) rule in Sanskrit that reduces every short /a/ to [ə],¹⁹ whereas /ā/ (which could be represented as an underlying //a a//) is not reduced. But this Reducing rule cannot precede Sandhi, since word-final /a/ combines with word-initial /a/, yielding /ā/, not */ə/. Indeed it has always been recognized that this Reducing rule should be very late; it is actually the last sūtra in Pāṇini's grammar.

2. There must be a rule that converts underlying //āw// into /aw/ before consonants and at the end of a word; but it must follow Sandhi, since, for instance, ubhau (underlying form //wbhāw//) is ubhau before consonant and in final position, but ubhāv before a vocalic initial.

All analogous facts could be generalized by saying the following.

1. Sandhi operates on deeper underlying forms than those yielded by some word-level rules.

2. Consequently, the true word boundaries inserted by the syntax must be removed so that Sandhi will not apply above the word level.

This conception enables us to capture a fact that is generally obscured: There are, properly speaking, no specific Sandhi rules. Except for final position (in Sanskrit the end of the sentence), all Sandhi facts (assimilation, deaspiration, vowel contraction, etc.) are handled by rules that are needed not only between morphemes inside the word (the so-called internal Sandhi), but also inside morphemes.²⁰ From this point of view, it could be said that what defines the general notion of Sandhi or Truncation is not that some special rules exist for regulating relations between different words inside some syntactic groups (the phrase in French, the whole sentence in Sanskrit), but that the limits of the words are extended so as to enclose syntactic groups to which word-level rules will apply in the required order.

For French the order would be the following: The Truncation rule has to precede the Gliding rule. Final Schwa Deletion must follow Final Consonant Deletion, which must, in turn, follow Truncation. The Nasalization rule must precede the Gliding rule, but we do not know its position relative to Truncation, nor do we know the position of Final Consonant and Schwa Deletion with respect to the Gliding rule.

If the analysis that we have presented is correct, French phonology appears to be very different from English phonology, where there are cyclic rules and all iterative rules are cyclic: French has no cyclic rules (unless intonation facts are cyclic, which does not seem likely), and only one iterative rule that is not cyclic (cf. Delattre¹⁶). The mere possibility of such a diametrical difference raises an interesting problem for phonological typology.

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J.-C. G. Milner

Footnotes and References

1. C.-J. N. Bailey and J.-C. G. Milner, "The Major Class Features 'sonorant' and 'vocalic' and the Problem of Syllabicity in Generative Phonology with a Note on the Feature 'High'," (unpublished).
2. S. A. Schane, "The Phonological and Morphological Structure of French," Ph.D. Thesis, M. I. T., 1965 (unpublished). Schane's rules can be informally expressed

as follows:

$$\text{Truncation} \left\{ \begin{array}{l} V \rightarrow \emptyset / \text{---} \left\{ \begin{array}{l} + \\ (\#) \# \end{array} \right\} \left\{ \begin{array}{l} V \\ G \end{array} \right\} \\ C \rightarrow \emptyset / \text{---} \left\{ \begin{array}{l} + \\ (\#) \# \end{array} \right\} \left\{ \begin{array}{l} C \\ L \end{array} \right\} \end{array} \right.$$

$$\text{Final Consonant Deletion } C \rightarrow \emptyset / \text{---} \# \$$$

V = vowels, G = glides, C = consonants, L = liquids and nasals.

+ = formative boundary. # = word boundary. \$ = phrase boundary.

3. S. A. Schane, *op. cit.*, p. 56.
4. Our rules for Truncation would thus be informally:

$$\left\{ \begin{array}{l} V \rightarrow \emptyset / \text{---} \left\{ \begin{array}{l} + \\ \# \end{array} \right\} V \\ C \rightarrow \emptyset / \text{---} \left\{ \begin{array}{l} + \\ \# \end{array} \right\} \left\{ \begin{array}{l} C \\ G \\ L \end{array} \right\} \end{array} \right.$$

For the formalization of the rule, cf. the new feature system proposed in Bailey and Milner, *op. cit.*

Our proposal seems a feasible way of treating the distinction between the words quoted. It should be added that some facts of optional liaison seem to provide an even stronger argument for it: A word like ouate admits two treatments, l'ouate or la ouate. For us, this would mean either that for this word we have two underlying forms, one with //u//, the other with //w//, or that Gliding can exceptionally (and optionally) apply before Truncation.

But in Schane's approach, whether the word begins with a vowel or with a glide, it should entail truncation of the preceding vowel, so that the only way to obtain the correct result would be to posit an optional //h// by what seems quite an arbitrary procedure.

5. M. Halle, Private communication, 1967.
6. We accept the current theory about boundaries. (For the symbolism, cf. note 2.) What we shall call "true word boundary" (as opposed to the "simple" word boundary or single #) must be understood as ##.
7. S. A. Schane, *op. cit.*, p. 42.
8. This argument is not fundamentally modified, if we consider part (a) of the Nasalization rule as a universal marking convention:

$$[u \text{ Nasal}] \rightarrow [+Nasal] / \left[\begin{array}{c} - \\ \bar{V} \end{array} \right] N \left\{ \begin{array}{l} C \\ \left[\begin{array}{l} -\text{seg} \\ \vdots \end{array} \right] \end{array} \right\}$$

9. It is true that the elements noted with the graphemes oi and ui (generally transcribed [wa] and [qi]) never present this alternation, but are always monosyllabic. Yet this should rather be considered as an argument showing either that the current

transcription is misleading and that oi or ui, which are underlying diphthongs, denote also rising diphthongs in the output, namely [_ua] and [_ui], — or that the Truncation rule does not apply at the stage of a derivation where word-level rules have all already applied.

At any rate, it is necessary to distinguish between the elements written oi, ui and the groups glide + vowel that are produced by the Gliding rule, since oi and ui are monosyllabic after a heavy cluster even inside a formative: cf. trois, construit.

10. S. A. Schane, op. cit., p. 98.
11. What occurs in this case for Schane is consequently not Truncation properly, but Final Consonant Deletion. We agree with Schane in considering the two rules to be different.
12. It is now easy to account for some irregularities in liaison, for instance, the puzzling fact that there is, in general, no liaison between a noun and the following adjective if the noun is singular (sang-k-impur is exceptional and archaic), while there is liaison if the noun is plural. The same discrepancy exists between noun and verb (le savant/ a dit vs les savants-z-ont dit). Since it is flexible, a readjustment device can always be restricted according to needs; here it would be formulated to apply, between noun and following adjective or verb, only for the plural formative /S/. In all of these cases a possible readjustment would be to erase a # so that only one would remain, or also to reduce one of the successive # to +. For the present, we see no way to specify the procedure more precisely, but it will always imply that rules have to distinguish between single #, #+, ##, etc.

The fact that in our approach the true word boundary is sufficiently strong to prevent liaison does not make the phrase boundary useless. From a general point of view, it is needed for some junctures that never are readjusted, for instance, at the end of a line in poetry. Particularly, it can be used to explain why there is no truncation before quotations: le "ignorant!" de Toinette, les/oh et les/ah. It is indeed very likely that such elements, being syntactically outside the sentence, have at least phrase boundaries associated with them (I am indebted for this suggestion to C.-J. Bailey). And this device can be extended: it is well known that number or letter names beginning with vowels do not entail truncation of the preceding article: le un, le onze, le a. Instead of marking two different classes as identically exceptional, it would be convenient to consider these elements as quotations: when a letter or a number is preceded by the article, it is mentioned, but not used as such.

It is very striking, for instance, that in les uns as opposed to les autres, where uns is not a number name but a pronoun, there is a liaison, whereas in les uns meaning 'several "1"s', no liaison occurs. The fact that les huit is without liaison ("huit" is mentioned), but dix-z-huit has a liaison ("huit" is used as a number) could perhaps be explained in the same way (the h here is purely graphic, cf. lat. octō).

13. The fact that we would have a different kind of boundary, namely the true word boundary, is not relevant for Schane's demonstration, which could be modified accordingly.
14. Schane says that the final [ə] in camarade would drop in this alternative, because of the following vowel, but this cannot be right, since the Truncation rule does not apply across #\$.
15. Schane, op. cit., p. 105.
16. Cf. Pierre Delattre, Studies in French and Comparative Phonetics (The Hague, Mouton et Cie., 1966).

It should be added that a rule for this dropping should be very late and operate with those [ə] that would remain after Truncation and after Final Schwa Dropping. Moreover, the rule would have to apply to its own output, since the number of preceding consonants depends on its previous application; in je n' le d'mand' pas, the

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[ə] cannot drop in le because it has dropped in ne. This kind of noncyclic iteration does not appear for any other rule in the grammar, it seems.

17. Schane, op. cit., p. 103.

18. From this point of view, the conservation of schwa before a strong boundary appears as a properly dialectal fact, and it should be carefully ascertained by those who want to study this kind of dialect: (i) whether these dialects have any truncation rule at all; (ii) whether in the example quoted the final form is not precisely "camarade anglais."

This is simply a question of fact, and so specific, moreover, that it should be irrelevant for a general theory of Standard French, though it is crucial for Schane's approach.

19. W. D. Whitney, Sanskrit Grammar (Harvard University Press, Cambridge, Mass., 2d edition, 9th issue, 1960), p. 1.

20. Such a conception of Sandhi is already implied by the account that we previously proposed for Edgerton's Law (Bailey and Milner, op. cit.). It is very clear that the rule that at the end of the word /u/ goes to [v] before a vocalic initial is, in fact, an application of Edgerton's law, as it is applied inside a formative (cf. for instance vác+ati 'he speaks', vs uk+tá- 'spoken'); in fact, the set of conventions that constitutes Edgerton's law must apply inside an utterance (or a line in the Veda) irrespective of any different boundaries that the syntax may have inserted. This extreme character cannot, however, be attributed to French, where the truncation rule can only apply when there is in the environment a [-seg] element. Even for Sanskrit, such a statement would have to be qualified, since there are minor differences between external Sandhi, which occurs between autonomous words, and internal Sandhi, which occurs inside the word, between nonautonomous elements (stems, endings, suffixes etc.).

Addendum

In a recent paper, "The Morphophonemics of the French Verb," Language XVII, December 1966, 746-58, Schane presented a revised version of his truncation rules, where he recognized the necessity of a Schwa Deletion rule: $\text{ə} \rightarrow \emptyset / \text{_____} (\text{C})\#$ (p. 747).

But this deletion is still viewed as a minor phenomenon that a general theory can neglect. Moreover, it is considered to be a single process that may or may not occur, "depending on the particular dialect or style under consideration" (ibid., p. 747), although there is a process of [ə]-deletion that does not depend on stylistic differences in the dialect where it occurs, but on purely phonological conditions, namely the presence of a strong boundary.

It is not surprising that the rule as stated shows the confusions that we pointed out in our article. We shall use Schane's own example: The third plural vivent /vivet/; such a form will illustrate both environments C# and #.

1. Environment C#

The /t/ can be present only if a vocalic initial follows the juncture: ils vivent aussi. We are thus inside a group for which the Truncation is defined, and it coincides with the "unité de sens" where the late schwa dropping occurs (as in je ne le demande pas) and

indeed the constraint on the number of preceding consonants applies here: oppose ils masquent aussi or ils perpètrent aussi, where the schwa does not drop.

2. Environment

The final /t/ in vivent can drop for two different reasons, by Truncation, before a consonant, or by Final Consonant Deletion, before a strong boundary (phrase or true word boundary in our approach).

(a) Truncation: ils vivent donc

We are inside the same kind of group as before, and the same constraint applies: in ils masquent donc, ils perpètrent donc, schwa does not drop. This is, consequently, another instance of late schwa dropping.

(b) Final Consonant Deletion: ils vivent

Here on the contrary, we are no more inside a group, but at its end. And the fact is that the constraint on the preceding cluster does not apply; schwa always drop: ils vivent [il viv], ils masquent [il mask], ils perpètrent [il pɛrpɛtr].

This clearly shows that two different phenomena are involved, which the rule illegitimately collapses in such a way that its formulation is always wrong: if Schane's rule is to capture the late schwa dropping, it should specify the preceding environment (at most, one consonant) and contain only optional weak boundaries (moreover, it should be iterative); if it is to capture the final schwa dropping, it should specify # (and ## in our approach), not only #, and contain no C.

B. TONE PATTERNS IN CHINESE REGULATED VERSE

The liuh shy, or regulated verse, is a form of poetry which originated about the time of the Tang Dynasty and contrasted with the guh shy, or ancient verse, and the tsyr, or chanted verse. The form is distinguished by the constraints that it imposes upon the tones of the syllables occupying each position in a line, as well as the composition of these lines into octets.

Tang Dynasty Chinese had four tone classes which in poetry were subdivided into two categories, the even, or pyng, tones, and the deflected, or tseh, tones. It is in terms of the last categories, rather than the actual tones, that the constraints are stated. The regulated verse form is either a pentasyllabic or heptasyllabic octet with obligatory rhyming of the even lines and an optional rhyme of the first line. Rhyming in these poems meant the same rhyme throughout any single octet and, as in all Chinese poetry, the rhyming syllables must not only have the same final sound as in European poetry, but also have exactly the same tone. Moreover, nonrhyming lines (in this case, the odd lines with the possible exception of line 1) must not only be different in the final sound of the last syllable, but the tone of the last syllable must be of the opposite category as the rhyme (i. e., if the rhyming syllables are pyng, then nonrhyming lines must end in tseh syllables and vice versa). Other constraints concerning the syntax and semantics of the internal quatrain were also imposed, but will not be discussed here.

The 16 abstract patterns in terms of the tone categories can be totally prescribed from two initial choices, the tone category of the rhyming syllable which will be designated α , and the tone category of the penultimate syllable of the first line which will be designated β . (Recall that tone category refers to the categories pyng, tseh.)

The ultimate syllable of each line is then determined by the initial choice α such that all even lines must end in syllables of category α , and all odd lines with the possible exception of line 1 must end in syllables of the category $-\alpha$ (where $-\alpha$ is to be interpreted as being tseh if α is pyng, and as pyng if α is tseh). Line 1 is an exception if and only if it is further determined that line 1 is to be included in the rhyme scheme. Only in this situation can the ultimate syllable of line 1 be of category α .

Similarly, the tone category of the penultimate syllable of each line is determined by the initial choice of the tone category of the penultimate syllable of the first line. The penultimate syllables of lines 4, 5, and 8 are of category β , whereas the penultimate syllables of lines 2, 3, 6, and 7 are of category $-\beta$. That is, if one considers an octet to be composed of two quatrains, the first being lines 1 through 4 and the second lines 5 through 8, then the penultimate syllables of the exterior (i. e., the first and last) lines of both quatrains must be identical and hence of category β , while the penultimate syllables of the interior lines must all be of the opposite category, that is, $-\beta$. By considering the octet to be composed of two quatrains, one can then also describe a later

metrical form that consists in only four lines, but which adheres exactly to the constraints in tone patterns imposed on the first quatrain of the regulated verse.

In more precise notation, the preceding can be formulated as follows: Let P_i designate the penultimate syllable of line i , and U_i designate the ultimate syllable of line i .

Then

1. $U_i = \alpha$ for $i = 1$ (if line 1 in rhyme scheme)
 i even
 $U_i = -\alpha$ for $i = 1$ (if line 1 not in rhyme scheme)
 i odd, $i \neq 1$
2. $P_i = \beta$ for $i = 1, 4, 5, 8$
 $P_i = -\beta$ for $i = 2, 3, 6, 7$

The remaining positions in each line are then filled in according to the following rules. The rules are stated for the heptasyllabic line. The pentasyllabic line is identical in structure to the heptasyllabic line, beginning with the third syllable.

3. Syllable $4_i = -P_i$, syllable $2_i = P_i$ (where i refers to the line number)
4. Syllable $5_i = -U_i$
5. Syllable $1_i =$ syllable 2_i , syllable $3_i =$ syllable 4_i

Thus one sees that with statements 1 through 5, one can specify the tone patterns of the 16 accepted abstract patterns for the liuh shy, by making only two initial choices. Of these 16 patterns, eight may be challenged, in that they permit the rhyme of the poem to be a tseh rhyme. While it is the case that in the majority of the discussions about this poetic form, such abstract patterns are not mentioned, there are numerous examples of poems constructed according to liuh shy constraints which utilize a tseh rhyme, and hence the patterns permitting tseh rhymes have been considered here to be legitimate abstract forms.

Nancy Woo

C. ON 'ANIMATE' AS A SEMANTIC MARKER

A remark that J. J. Katz makes on semantic markers is "... , although the semantic markers are given in the orthography of a natural language, they cannot be identified with the words of expressions of the language used to provide them with suggestive labels."¹

As a consequence, the problem arises: How then can a label for a particular semantic marker be interpreted? If it is agreed that the label for a semantic marker does not have to be interpreted in the same manner as it is normally interpreted in a natural language, that, too, must have an interpretation. We do not think that Katz will defend the position that this interpretation of a semantic marker, which belongs to a language L_1 , is necessary or sometimes not expressible explicitly in this natural language L_1 (or in a language).

To make the interpretation of a label of a semantic marker Y explicit, we can use as control for a proposed interpretation (a) the accepted selectional restrictions that mention this marker Y, (b) analytical and contradictory sentences in which the semantic marker Y appears.² In other words, since we have a hypothesis of the function of a certain semantic marker (in respect to selectional restriction, analyticity, contradiction, etc.), we can try to find an explicit interpretation of the label that is at least reconcilable with the hypothesized function. Perhaps, if no explicit interpretation that is reconcilable with the hypothesis can be found, we may change the initial hypothesis, or perhaps be obliged to make a major change in the theoretical framework.

With this in mind, we shall try to find an explicit interpretation for the semantic marker 'animate'.

We know that the following sentence (2) is semantic anomalous for Katz, on the basis that a verb such as 'eat' requires an animate subject (this is a selectional restriction on the verb 'eat').

- (1) This bird eats.
- (2) This table eats.

Sentence (1), however, is semantic. As a consequence, we know that the semantic marker "plus animate" must belong to the set of semantic markers of 'bird', but must lack this one of 'table'. What kind of interpretation have we to give to 'animate', so that 'bird' has the "property" described by this label, but that 'table' does not?

As far as that is concerned, the interpretation that is easiest is that something "is alive." This interpretation does not fit, however. If "animate" has the interpretation of "being alive" and if "this semantic marker" belongs to the semantic reading of 'bird', then "this bird is alive" or "this living bird" must be analytical. Sentence (3) is not contradictory, however, but sentence (4) is.

- (3) This bird is dead.
- (4) This living bird is dead.

Consequently, 'animate' – in the hypothesis that it is a part of a semantic reading of 'bird' – cannot have the interpretation of 'living'. If the hypothesis that it is a part of a semantic reading of 'bird', is rejected, and if we keep constant the hypothesis of the earlier mentioned selectional restriction on the verb 'eat', viz., having an animate subject, then sentence (3) must be semantic anomalous, but certainly it is not.

A tentative stance to get a solution for this problem is that the significance of 'dead' is synonymous with "been alive but not anymore." This interpretation of 'dead', although perhaps correct, offers no solution here. The reason why is that sentence (5) is not contradictory, but sentence (6) is.

(5) This bird was alive, but not anymore now.

(6) This living bird was alive, but not anymore now.

Another kind of tentative position for a solution is to try to find another interpretation for "animate" which differs from "being alive." The first of this kind is the proposal to interpret "animate" as "organic." Although this solution seems very attractive, it is much too broad because, as a consequence of this interpretation, sentences (7) and (8) would be semantic, and sentences (9) and (10) anomalous.

(7) A wooden door eats.

(8) A tooth eats.

(9) An iron door eats.

(10) A stone eats.

That is certainly an unnatural result.

Another tentative answer is, at first glance, more successful. It is the following. 'Animate' must be interpreted as "a typical member of his species is alive." Consequently, "a bird is dead" is not contradictory, nor is "this bird is alive" analytical.

With this interpretation, a sentence such as "This dead bird eats" is not contradictory nor semantically anomalous. We think that Katz would like it to be one of those. He can accomplish this, for instance, by saying that 'eat', 'think' (viz., all verbs with a selectional restriction of animate) have a semantic marker 'alive'. If that is so, then 'this dead bird eats' becomes contradictory.

Two remarks must be made. First of all in this approach, sentence (11) is anomalous.

(11) This archaeopteryx eats.³

A typical member of this species is not alive. Consequently, 'archaeopteryx' is not animate (following the last definition). Therefore it does not fulfill the selectional restriction of the verb which requires animate subjects. Another remark is that if we say that 'eat' has a semantic marker 'alive', then sentences (12 and 13) and (14 and 15) are synonymous.

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- (12) He eats.
- (13) He is alive and he eats.
- (14) Eat!
- (15) Be alive and eat!

This does not seem very natural. What is still less natural is that sentence (16) is not contradictory, but sentence (17) is, although both must be synonymous, if 'alive' is a semantic marker of 'eat'. The reason for this is that when we negate the verb 'eat', we negate all of the semantic markers that are a part of the lexical reading of 'eat' (if this is not the case, we have to introduce a new type of negation).

- (16) He doesn't eat, but he is alive.
- (17) He doesn't eat and he isn't alive but he is alive.

In respect to the first remark, viz., the anomaly of sentence (11), the anomaly could be avoided by broadening the proposed interpretation of 'animate' to "a typical member of this species was once alive." Here, two new problems arise.

One is in connection with the nature of a semantic marker. Fodor and Katz⁴ contend that a semantic marker is atomic. If this implies that a semantic marker cannot be itself divisible into other semantic markers, then it is difficult to see how "a typical member of his species was once alive" does not need as a real part the semantic marker "past." The same can be said about an interpretation of 'animate' as 'having been alive'.

The other problem is that sentences (18) and (19), in this interpretation of 'animate', will be semantically anomalous.

- (18) The unicorn eats.
- (19) The giants eat.

In a theoretical specialized language this result can perhaps be acclaimed, but it seems a strange result for a natural language. The requirement that a typical member of a species has ever lived, seems rather arbitrary as a requirement for sentences (18) and (19) to be semantic.⁵

This report has been intended to attract attention to the interesting and not trivial work of making explicit the semantic markers that are used.

The author would like to thank Prof. Hilary Putnam, Y. Willems, and Dr. W. Vereecke for discussing some topics related to the problem in question. Of course, only the author is responsible for the point of view taken here.

F. J. Vandamme

References

1. J. J. Katz, The Philosophy of Language (Harper and Row, New York, 1966), p. 156.

2. We shall not summarize these well-known constructions, as they appear in the semantic theory of J. J. Katz.
3. Each species of animals or plants which does not exist anymore, can take the place of archaeopteryx.
4. J. J. Katz, and J. A. Fodor, "The Structure of a Semantic Theory," in The Structure of Language (Prentice-Hall, Inc., Engelwood Cliffs, N. J., 1964), p. 496.
5. We have discussed the bearing of this remark and this whole analysis of 'animate' on the problem of selectional restrictions, in an article "On the Significatum of a Morpheme" (unpublished).

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D. ENGLISH PHONOLOGY: SELECTED TOPICS

1. Notation

In report the following conventions and abbreviations are used.

If a vowel is unreduced, this will be indicated by the following symbols (W is some word):

*W: the underlined lax vowel is unreduced

^W: the underlined tense vowel is unreduced

°W: the underlined i is unreduced; or, the underlined tense or lax vowel reduces to i or ɪ.

With respect to [ō] and [ū], ^W indicates that the word is pronounced with /ū/; *W indicates that the word is pronounced with /ū̄/; and W indicates that the underlined vowel in W reduces. In general, if a vowel is reduced, it will be underlined with no further notation before the word.

The primary source for the pronunciation of words has been J. F. Kenyon and T. A. Knott, A Pronouncing Dictionary of American English, but Webster's Second International Dictionary has been sparingly used, as well as the "well-trained ear of the author."

Primary stress is indicated by an apostrophe (') before the stressed syllable; secondary stress is indicated by a comma (,) before the secondarily stressed syllable. Thus 'capi, llary, ,Archi'medes.

Phonemic forms are normally enclosed in brackets ([]); phonetic forms are normally enclosed between solidi (/ /). Intermediate stages may be with either or neither.

Among the less obvious phonetic and phonological symbols that we use are the following:

θ for bath

ɔ for bought

^ for but

ə for cou'rageous, etc.

ɪ for ci'gar, 'adage, etc.; and for the "underlying" vowel in pull as opposed to cull

ɜ̄ for bird

ɝ̄ for sur'mount

If an asterisk (*) occurs before a word with no vowels underlined, or before the indication of the pronunciation of a word, or before part of a word or pronunciation, it indicates that what it occurs before does not exist, or is not a possible pronunciation of the word in question.

"SPE" refers to the Sound Pattern of English, by N. A. Chomsky and M. Halle (Harper and Row, New York, in press).

2. Tensing Lax \ddot{u}

Consider the word uvula. The second -u- must originally be lax, because of the stress. Thus we need a rule inserting a /y/ before at least some u's, and the word Neptune shows us that it must also receive secondary stress. Such words as fenugreek and duplex show that the rule must also operate before at least some consonants + liquid; bun shows us that the consonant(s) after u must have a vowel after it; and custodian shows that the rule is inoperable before two true consonants.

Note that if the diphthongization and vowel shift rules are allowed to apply to $\frac{1}{\ddot{u}}$ (tense, stressed, diffuse, grave, non-round vowel), we shall end up with / $\bar{u}w$ /. Thus, the rule that we need for uvula, as given in SPE, is:

$$u \longrightarrow y \frac{1}{\ddot{u}} / \text{_____ } C'_0(L) V.$$

(Actually this is two rules: $u \longrightarrow \frac{1}{\ddot{u}}$, and $\emptyset \longrightarrow y / \text{_____ } \frac{1}{\ddot{u}}$; note that, after dentals, depending on the dialect, the -y- is optionally or obligatorily deleted.)

The question now is: Do we need $[\frac{1}{\ddot{u}}]$ in the phonemic representations of English words? SPE tries to answer this in the negative. Let us, then, examine this problem, assuming for the moment that we do not, in fact, need underlying $[\frac{1}{\ddot{u}}]$. (That is, we assume that all pronunciations /-y \bar{u} /, /-y \ddot{u} -/, /-y \emptyset -/ not in word-initial position come from underlying -u-.)

First of all, the words mugwump, Budweiser, Ludwig, bushwhack, and ruswut (/r \wedge sw \wedge t/) show that we must not include glides, as well as liquids, in the optional environment of the rule.

The following words:

^ <u>n</u> utrition	* <u>g</u> enu <u>f</u> lection	^ <u>E</u> uclid	^ <u>r</u> ubric
^ <u>F</u> inno- <u>U</u> gric	^ <u>p</u> utrid	^ <u>c</u> ypric	^ <u>U</u> kkraine
^ <u>K</u> u <u>l</u> lux klan	^ <u>d</u> uplicate	^ <u>F</u> en <u>u</u> greek	^ <u>n</u> ucleus
^ <u>E</u> uphrates			

appear to show that we were correct in including liquids and only liquids in the optional environment.

These words:

<u>c</u> ouple [cupl]	<u>s</u> extuple [sekst \ddot{u} pl] (but cf. <u>s</u> extuplets, /seks'ty \bar{u} plits/)
<u>s</u> upple [supl]	<u>t</u> ruffle [truf \bar{l}]

all having the underlined vowel pronounced / \wedge /, are readily explained if we take the form in brackets as the underlying form, since -u- will then not be in the proper environment for the rule, whereas such words as

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^fugleman [fuglemæn] (not [fugelmæn] because of the stress)
 ^bugle ([bugle])
 ^lucre ([lucre])

undergo the rule if they have the underlying forms given.

The word juggle (cf. jugglery - /j^gləri/) can be spelled just as in the orthography (cf. electric, pastry, mistress, bundle, to see that clusters such as -CCL- are permissible in the language. Likewise are explained: Luttrell, buttress, chukram, Douglas, suffrage.

Consider the words supplant, supply. Comparing implant, transplant; imply, reply; and suppose, succeed, we see that the underlying forms for these words are [suB=plænt] and [suB=ply]. Because of jugglery, we see that $u \rightarrow \frac{i}{\pm}$ applies before the degemination rule, which is necessary, since English has no intramorphemic phonetic double consonants. But these words, together with subordinate ([suB=ordinate], cf. co-ordinate), show us it must also apply before the = boundary is deleted, since this boundary is not mentioned in the rule, and thus renders it inoperative.

We also see from ugly that we must allow only vowels after the intervening consonant(s); [y] is excluded.

We do find, however, certain types of cases in which the rule as given must be modified. Firstly, it cannot apply before -bl-, -dl-, or -tl-. Note the words:

<u>-bl-</u>	<u>-tl-</u>	<u>-dl-</u>
sublimate	Rutledge	Dudley
sublime	Rutland	Ludlow
public	Nutley	Ludlovian
publican	Jutland	huddle
publication	cutlass	puddle
publish	cutlery	muddle
Dublin	sutler	fuddle
troublous	butler	ruddle
doubloon		

These words plus a total lack of any words with the pronunciations /-yūbl-/ , /-yūtl-/ , /-yūdl-/ , not across a word boundary show that we must exclude these clusters from the rule. Note that the few words pronounced with /-ūbl-/ , namely Kubla and ruble, do not have the optional pronunciations with /-y-/ after a dental (i. e., */ryūble/ , cf. Rufus: /rūfəs/ , /ryūfəs/), showing that the underlying vowel is indeed [ō] and not [u]. The single apparent exception 'chasuble can be spelled underlying [čæsūbVl]. The absence of any pronunciations /[yūdr]/ is probably merely an accidental gap. In any case we have no provable examples of [-ūdrV-] > /-^d(ə)r-/.

Also, the words:

muslim	musrol	rushlet (?)	mushroom
hurly-burly	burly	surly	curly
drumlin	bulrush	unless,	

again together with a total lack of words with the pronunciation /-yū-/ followed by any of these clusters, shows that they, too, must be excluded, see below for Euphrates.

Finally, the words:

gullible	hullabaloo	hurricane	hurry
nullify	pulley	bullet	scullion
scurrilous (cf. scu'r'rility)		Sullivan	courage

show that geminate liquids, too, must be excluded from the rule's environment.

In fact, the only clusters which permit the rule to operate are: -pr-, -tr-, -kr-; -br-, -dr-, -gr-; and -kl- and -gl-.

Duplicity and genuflect are the only two cases known to me where the rule ostensibly applies before -pl- or -fl-. Excluding these two words, it is seen that if the liquid is l, the consonant must be [-diffuse] for the rule to operate. Thus the rule is

$$[\check{u}] \longrightarrow /y\bar{u}/ \text{ / } \text{---} \left[\begin{array}{l} +\text{obstruent} \\ <+\text{diffuse}> \end{array} \right] \left(\left[\begin{array}{l} +\text{vocalic} \\ +\text{consonantal} \\ <+\text{continuant}> \end{array} \right] \right) \left[\begin{array}{l} +\text{vocalic} \\ -\text{consonantal} \end{array} \right].$$

Observe that soluble apparently must be [solubil] (cf. solubility), or we could not get /-yū-/. [But notice that soluble < solv + able, so perhaps

$$v \longrightarrow u / l \text{ ---} + \left\{ \begin{array}{l} \bar{a}et \\ \bar{a}bl \end{array} \right\} \quad (\text{cf. solution}),$$

and the [æ] drops only after u $\longrightarrow \frac{1}{\frac{1}{2}}$; for we do want to keep the -bl- intact in this suffix.]

Returning to our original question, we now examine certain cases not capable of being handled by the $\check{u} \longrightarrow \frac{1}{\frac{1}{2}}$ rule. None of Brunhild (/brūn'hild/), Ruthven (/rūθ'ven/) and louvre (/lūvər/) can have the /-yū-/ option, so we can spell them [Brōnhilde], [Rōθvenne], and [lōvr], respectively. Upsilon, Euphrates, Eustace, eustachian, Euston, euxenite, and Euxine can all be spelled with initial [yō-]. Newspaper and suitcase are compound words ([[nue#s]##[pæper]] and [[sute]##[cæes]], respectively). We are however, left with the following words, which if not spelled with $\frac{1}{\frac{1}{2}}$, must be classed as exceptions:

Houston	(/hyūstən/)
Knudsen	(/nyūdsən/)
zeugma	(/zyūgmə/).
coiffure	(/kwā'fyūr/;

the last cannot be [kwɔ(f)fure] because of the stress; it also cannot be [kwɔfurre], for

in that case it would be */kwā'fɜ̃/).

Finally, consider the words

impugn
repugn
oppugn
expugn.

Comparing

oppugnant
repugnant,

we see that the stem in question is [=pugn].

We recall from SPE that lax \check{u} normally undergoes vowel shift to \wedge (cf. tuck, tub, gut, pub). In some cases, however (e. g., put, bull, full), the \check{u} unrounds to \dot{i} , so as not to undergo vowel-shift. Thus we would expect =p \check{u} gn to become p \dot{i} gn by this rule. Now, since we have no -gC# clusters appearing finally in English, we need a general rule to get rid of g here. To get righteous (/rāy \check{c} əs/) from right we must have a consonant before the \check{t} (cf. propitious: /-p \check{i} səs/), which SPE claims is X (which usually changes to h). This pre-consonantal X, furthermore, causes lengthening of a preceding diffuse vowel, and then deletes. But now we see that precisely the same phenomenon will account for impugn if we change the g to X (or ɣ): [=p \check{u} gn] → p \dot{i} gn → p \dot{i} Xn → p \dot{i} Xn → py \dot{i} Xn → py \dot{i} n → /pyūn/. In repugnant, the \check{u} remains, the g does not change (cf. stigma) and we thus get /-p \wedge gn-/. Compare diaphragm – diaphragmatic, phlegm – phlegmatic, sign – signatory to see that the vowel-lengthening rule applies only to diffuse vowels.

The reduction of vowels obtained from the $\check{u} \rightarrow \frac{1}{\ddot{t}}$ rule seems roughly to follow a frequency rule¹; but there are two stages in their reduction:

unreduced:	-yū-	(^hu'mane)
partially reduced:	-y \check{u} -	(*diu'retic)
reduced:	-yə-	(modulate).

3. A Linguist Looks at Aristotle

The following observations about Aristotle and humble are due to J. R. Ross.

The problem is, what is the underlying form for Aristotle? Noting the form Aristotelian, we would like it to be [æristotel], but this gives us the stress *A'ristotle. We next try [æristotl], but this also gives us *A'ristotl. Aha! cry we. Why not spell it as the literate layman does: [æristotle]. Now, -tl- being a strong cluster,² we get original stress [æristotle], and, slightly modifying the rule that shifts stress back

on, for example, 'Arkan, saw to allow a final -e, we get finally [ærist¹ɔt³le]. The same derivation works for the following words:

'muskellunge ([muskellunge] or ?[musklunj])
 'Arbuth, not ([ærbuθnɔtte])
 'Ciren, cester ([cirencestre]).

Fine. But now observe that we need a rule to insert the -e- before l + ian.

Although we find such words as

churl
 churn
 charm
 balm ([bælm], cf. SPE)
 kiln
 hymn (cf. hymnal),

we note that we never find provable examples of morpheme-internal -mr-, -nr-, -ml-, -nl-, or (?) -nm- in English. The words

seemly
 drumly
 slovenly
 only
 bottomry
 demonry
 masonry

involve affixes -ly and -ry, and such words as

Hummel
 dinner
 fennel
 glimmer

have no alternations, and thus may have their orthographic spelling as their underlying forms, too. But now we note the alternations:

humble	-humility
tremble	-tremulous
number	-numeral, numerous, numerical
remember	-memorial
gender	-generic, general.

These are almost the only ones of their type. Now, we need certain vowels inserted in the environment

C _____ l + certain suffixes

in any case (see SPE. -Able must be monosyllabic, but we get -a'bility, so -i- must be

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inserted at least here, for example; cf. -ably. Also, we would like for noble to be a monosyllable, to get nobler instead of more noble (cf. "On Adjectival Comparisons and Reduplication in English," unpublished paper by E. Wayles Brown); but we have nobility. With the rule in question, however, we get [nōbl+ity] — /nō'bility/. Note further the insertion of -u- here before the suffix -al, as in titular). Now we see that we can spell the stems above, respectively, as

huml
treml
numr
rememr
genr,

and when a suffix is added, the appropriate vowel will be inserted (-i- before l + ity; -e- before r + ic; -ɔ- before r + ial; -e- before l + ian; -u- before l + ɔs; -e- before r + ɔs; etc.). If no suffix is added, the homorganic voiced stop is inserted after the nasal. (Observe that this must be before the stress rule, to get re'member and not *'remember, since -mr is a weak cluster; also the alternation, e. g., 'camel, Ca'melidae, which shows us that the underlying form is [cæmel], also shows that the b-insertion comes before e-elision, since otherwise we would get [cæmel] → cæml → *cæmbl.)

We cannot, however, just because of this rule's inserting homorganic stops in this environment, eliminate altogether underlying final nasal + stop + sonorant clusters, since we must explain the difference between

gender -generic

and

cylinder -cy'lindric,

namely

[genr + ic + æl] → gener + ic + æl → /jə'nerik/
[cylindr + ic + æl] → /si'lindrik/.

Also, the -t- in carpenter cannot be derived by this rule, so it must be [cærpentr]. Note that enamel must be spelled [enāmel] (or enæmmel], but not [enāml]), or else it would be */i'næmbel/.

With respect to final sonorant and stop clusters, note the word gingham (/ˈgiŋəm/). This cannot be [gingæm], or it would be /ˈgiŋgəm/, like /fiŋgər/ < [finger] or [fingr]. Also [ging#æm] is rather farfetched, although it would give us the correct pronunciation. But observe that if it is spelled [gingm], the n → ŋ before g, and the g drops (via γ and X) by the same rule that drops it for phlegm, diaphragm, sign, etc. (cf. phelgmatic,

diaphragmatic, signal). This observation is due to David M. Perlmutter. Hingham is likewise derived from [Hingm]. Another solution to this problem has been suggested³: namely, that the gh in the orthography represents an underlying X (as in right, v. supra), which causes η-formation before dropping. This is the only possible solution for dinghy, if it is pronounced /diŋi/. I cannot see anything to choose between the two solutions for gingham. For Birmingham (if pronounced /'bɜ^vmiŋəm/), the stress indicates the underlying form [birmingm]. Each solution thus appears both to regularize distributions (of sequences and phonemes, respectively) and to be necessary in certain cases.

Observe that, for the stop-insertion rule, we only have examples for -mr-, -ml-, and -nr-. We note the following puzzling or exceptional words for these clusters, and examples of -nl-, -lr-, and -nm-:

- Cymric
- Cymry
- Benrus
- Monroe
- *Amritsar
- °jinricksha
- °Kinross
- *tamlung
- *Henrico
- *Munroe
- *Enroughity
- *Penrith (the first three are the only examples I know of for -ml-, -nr-, or -mr-, with preceding stress; perhaps the rule operates only in word final position or only after a stressed syllable)
- *Henlopen
- *Dalrymple
- chivalrous, chivalry
- cavalry (note that rivalry, revelry contain suffixes and are thus irrelevant, but cf. deviltry)
- cleanly ([?clēn+ly])
- enemy, enmity, inimical (?[enmy], [enm+ity] → enmity;
?[enm+iic+æɫ] → /ɪnimikəl/)
- grandam (/grændəm/) – grandmother (/grænm-/))
- clangor - clamorous [? if from [clæmr], why clangor and not clambor?
probably unrelated]
- detainder – detain, detention
- reminder – reminiscent
- remainder – remaining, remnant.

4. On the Provenience of Certain \check{u} 's

Following is a list of (?all) words showing an alternation in English of a stem presumably ending in a consonant which "adds" a \check{u} - before certain suffixes:

tempest	tempestuous
sense	sensual, sensuous
theft	theftuous
spirit	spiritual
tumult	tumultuous
torrent	torrentuous (cf. torrential)
contempt	contemptuous
sex	sexual
fact	factual
contract	contractual
effect	effectual, effectuate
intellect	intellectual
aspect	aspectual
instinct	instinctual (cf. instinctive)
habit	habitual, habituate
accent	accental, accentuate
advent	adventual
event	eventual, eventuate
concept	conceptual
percept	perceptual
text	textual
context	contextual
presume	presumptuous (?< presum + \check{u} + ɔs)
incest	incestuous
convent	conventual
tact+ile	tactical
precept+ive	preceptual
fructify	fructuous, fructuate
flexile	flexuous
strain	strenuous
site	situate
act	actual, actuate
grade	gradual
rite	ritual
?use	usual
?reside	residual

It may be that the endings -æ and -ɔs must appear after but a single consonant, and, if they are added to a word ending in two consonants, a -u- or -i- (depending on the stem? or sometimes on the particular two consonants?) is inserted before them. Note that a \check{u} - seems to be inserted between the two segments -Cl- , if followed by +æ (e. g., [circl-æ] \longrightarrow circul+æ r). On the other hand, the lack of any stems ending in -u- before -ize , -ite , -ule , -ile , etc., together with such pairs as $\text{tactile - tactical}$, suggests that perhaps in these cases the stem ends in \check{u} (or $\text{+}\check{u}$, cf. hindu), which gets deleted at the end of a word or before a diffuse vowel.

5. h-deletion

We wish to relate the following sets of words:

harmony – philharmonic

hortatory – exhortation.

Note the two pronunciations of philharmonic: /,filər'mānik/ and /,filhār'manik/, from [fil+hærm+iic] and [fil+[hærmɔny]+iic], respectively. Note that the [h] drops before the unstressed vowel after a single consonant. Now observe the two pronunciations of exhortation: /,egzɔr'tēsən/ and /,egzər'tēsən/. The [h] drops here even before a stressed vowel, after two consonants. We are thus led to postulate the following rule:

$$h \rightarrow \emptyset / \left\{ \begin{array}{l} C_2 \text{ —} \\ \left\{ \begin{array}{l} [-\text{cons}] \\ [+v\text{oc}] \end{array} \right\} C_1 \text{ —} \left[\begin{array}{c} V \\ -\text{stress} \end{array} \right]. \end{array} \right.$$

(cf. exhort-/ɛg'zɔrt/, to see that the stress on the following vowel does not affect the dropping of [h] after two consonants). Also observe

shepherd /ʃepərd/

as opposed to

cowherd /'kāwhərd/;

forehead (/fɔr'ɛd/, rare /'fɔr,hed/);

exhume (/ɛg'zyūm/, rarely /eks'hyūm/; cf. humus);

inhibit (/in'hibit/)

as opposed to

,inhi'bition (/,inə'biʃən/)

and

,exhibition (/,eksə'biʃən/)

ex'hibit (/ɛg'zibit/);

and finally

Wareham: /'wēr'hæm/ < [wær'hām]⁴

/'wērəm/ < [wær'hæm].

6. Pre-r e-insertion

The words

Danenhower
Eisenhower

may be handled perfectly regularly by assuming their underlying forms to be

[Dænenhūr]
[isenhūr],

which get stressed just like Arkansaw. But now we must have a (late) rule inserting an e between ū and r, to give /-'hāwər/. This is a general rule, however, applying in hour, bower, tower, etc., as opposed to bore, boor, bear, beer. Note ire, mire (homonymous with Meyer), showing that the rule applies after tense diffuse vowels before r. Note cowl, chyle, mile, showing that only r becomes syllabic here.⁵

J. L. Fidelholtz

Footnotes and References

1. J. L. Fidelholtz, English Vowel Reduction (unpublished). The "rule" says, roughly, that the more frequent a word is, the more likely weakly stressed vowels in certain positions are to reduce.
2. We see from many examples that -Cl- is a strong cluster. Cf., e.g.,

pan'tofle	(<[pæntɔfle])
debacle	(<[debɔcle])
nacelle	(<[næcelle])
Moselle	(<[moselle])
gazelle.	

The words

soluble
voluble

show that the $u \rightarrow \bar{i}$ rule comes after the e-insertion rule, and the word

qua'druple, which

must be from [kwædruple] to get the stress, shows that the e-insertion rule in turn comes after the e-elision rule, thus:

[kwædruple] → kwæ'druple → kwæ'drupl
kwæ'drupel → kwæ'dr̄ip̄el → /kwa'drupəl/
[vɔlubl] → 'vɔlubl → 'volubel → 'vɔl̄ibel
→ /'valyubəl/.

Notice that apostle is no problem, since ,apos'tolic shows us it must be [æpɔstɔl] in any case, although it may be the case that the -ɔ- in apostolic is inserted, and the underlying form is [æpostle].

We see also that when the second syllable of a word is stressed, a lax vowel in the first syllable always reduces before a single consonant, but is retained in infrequent words before two consonants, the only exception being if the two consonants are [-son] + r. cf.:

Ca'tron (/kə'trān/),

which, according to E. L. Thorndike and I. Lorge's The Teacher's Word Book of 30,000 Words, occurs less frequently than once every 4.5 million words (i. e., very infrequently), but

(*)At'lanta (/æt'ləntə/ or /ət'l-/),

which occurs over 5 times per million words, and usually has the first vowel unreduced. See Fidelholtz, op. cit., for details. That is, vowels always reduce before weak clusters (-Cr-) in this environment, but only in common words before strong clusters (-Cl-). Aristotle merely gives one further bit of evidence to exclude -Cl- from being a weak cluster.

3. By David Anderson, in personal communication.
4. See Fidelholtz, op. cit., for the rule that shifts primary stress from the last syllable to the first of certain bisyllabic words.
5. I wish to thank the various people with whom I have discussed some of these problems, and who have tickled (in the case of John R. Ross, often boggled) my imagination with their insight; especially John Ross, David Perlmutter, and Morris Halle. Any errors, of course, are clearly due to pernicious external influences.

