such examples as *sandy hair*, *sandy gold* and *sandy desk*: *sandy desk* is unlexical, in that this collocation is unlikely to occur in any grammatical environment, whereas *sandy gold* is merely unlexicogrammatical: there is nothing improbable about *golden sand*. An analogous distinction is observable in clichés: in *shabby treatment* the mutual expectancy is purely lexical, and is paralleled in *they treated him shabbily*, *a shabby way to treat him* and so on, whereas the collocation *faint praise* is restricted to this structure, in the sense that it will not occur with similar probability under other grammatical conditions.

[10] Compare the methods used to assess the *disponibilité* of lexical items in the development of 'Français Fondamental': see G. Gougenheim, R. Michea, P. Rivenc and A. Sauvageot, *L'élaboration du français élémentaire*, Paris, Didier (1956).

[11] P. M. Roget, *Thesaurus of English words and phrases* (1936 ed.), London, Longmans (1960), p. xiii.

[12] Cf. J. R. Firth, 'Modes of meaning'.

[13] The following text examples may be cited in this connection: festive animals, circumspect beasts, attired with culture, funny art, barren meadows, merry admiration, the situation of my stockings was a nightmare, lying astray, fashionable airliner, modern cosy flights, economical experience, delightfully stressed, serious stupid people, shining values, a wobbly burden, light possibility, luxurious man, whose skin was bleeding, driving a bicycle, old and disturbed bits of brick wall, a comprehensive traffic jam, her throat became sad, my head is puzzled, people touched with assurance, thoughts are under a strain, a sheer new super car.

[14] This research is being undertaken by Dr. A. R. Meetham and Dr. P. K. T. Vaswani at the National Physical Laboratory, Teddington, Middlesex.

Towards a Prosodic Statement of Vietnamese Syllable Structure

EUGÉNIE J. A. HENDERSON

The beginnings of my professional association with Professor J. R. Firth were coeval with those of my working acquaintance with the Vietnamese language, and the interaction between the two over the years was such as to suggest Vietnamese phonology as a fitting theme for a paper in the present volume.

When I made my first attempts at a phonetic description of Northern Vietnamese twenty years ago the prevailing tendency might fairly be said to be to use 'one magic phoneme principle within a monosystemic hypothesis'.[1] Such an approach produces 'phonemic solutions' that are in many ways unsatisfactory as statements of phonological function, whatever their merits from other points of view. There are aspects of Vietnamese pronunciation and of the distribution of Vietnamese sounds that are a challenge to phonetician and phonologist alike, as is witnessed by the variety in the phonetic descriptions and phonemic solutions that have been offered so far. Certain peculiarities of pronunciation and apparent disparities in distribution are so regular that it is clear that they should properly be viewed as systematic rather than accidental,[2] as integral parts of a coherent whole rather than as irrelevant oddities. The ideal phonological statement would be one in which these 'apparently eccentric features take a normal place',[3] one that would not so much solve the apparent problems as provide a framework within which they were found no longer to exist.[4] In the quest for such a statement I have found the outlook and techniques advocated by Firth both provocative and illuminating. It is the aim of this paper, not to provide a definitive phonological statement of Vietnamese syllable structure, for which much further work would be required,[5] but to demonstrate some of the lines of approach suggested by prosodic analysis to specific phonological problems, many of which have close parallels in others of the

vast range of languages in the Sino–Tibetan linguistic area. An attempt has been made to break free from some of the limitations imposed by more conventional analytical procedures, following Firth's teaching that 'no analysis or mode of analysis is the only one accurate or sacrosanct, but any account of the language, in any terms, is an adequate statement and analysis, provided that, and to the extent to which, it comprehensively and economically explains what is heard (and read) in the language, and "renews connection" with further experience of it',[6] and that 'under otherwise equal circumstances one will prefer that theory, which covers a larger field of phenomena, or which from some points of view appears to be . . . clearer'.[7]

Phonic Data

The phonic data which will be referred to in subsequent sections of this article are set out in the tables on pp. 168–173. These tables display the syllables attested by my informants for Northern and Southern Vietnamese, Northern Vietnamese (NV) being for the purpose of this paper defined as the educated speech of Hanoi, and Southern Vietnamese (SV) as the educated speech of Saigon.[8] The Northern material is set out on the left-hand page and the corresponding Southern material on the right-hand page.

The consonant letters in the Vietnamese system of spelling that may occur at the beginning of syllables appear horizontally in alphabetical order numbered from 2 to 24, absence of an initial consonant letter being numbered 1. Below each letter appears a symbol or symbols representing its pronunciation in general phonetic terms. It should be noted that 'c' and 'k', 'g' and 'gh', 'ng' and 'ngh', are pairs of orthographic variants, the first form in each case being that found before the letters 'a', 'o' and 'u' and the second that found before the letters 'i', 'y' and 'e'. Since there is no difference in pronunciation corresponding to the variation in spelling, each pair heads a single column, thus: c, k; g(h); ng(h).

In my material as originally recorded, the complexes of vowel and consonant letters and tone-marks that may follow the initial consonant letters appear vertically in alphabetical order, and in the appropriate place at the intersection of vertical column and horizontal line a tick marks every attested occurrence of the syllable concerned, special marks being added where the occurrence was limited to (a) words of known

and relatively recent foreign borrowing; (b) exclamations or onomatopes; (c) bound forms restricted to compounds or reduplicative formations; and (d) forms about which the informant was doubtful, or which he recognized as being in free variation with some other form. Considerations of space make it necessary in the present paper to include only the sequence of vowel and consonant letters of the final complexes, without tone-marks, and to reserve all other comments for the main text of the article. In the tables as here presented the finals without tone-marks appear vertically in alphabetical order numbered from 1 to 163. Such pairs of orthographic variants as 'i' and 'y', 'uinh' and 'uynh', 'uit' and 'uyt' are grouped together as one final. When examining the recorded occurrences of 'qu' it must be borne in mind that this is the orthographic representation of initial 'c' or 'k' with a following labial semivowel, and the finals with which it occurs should be compared with those spelt 'oa', 'ua', etc. Such finals are, for convenience, recorded twice, once in strict alphabetical order, i.e. 'qua' appears at the intersection point of 'qu' and 'a', and a second time, in round brackets, in the relevant column from the phonetic point of view, i.e. at the intersection point of 'qu' and 'oa'. Forms such as 'quy', 'quyên', etc., are recorded both at the intersection point of 'qu' and 'i, y', 'iên', etc., and, in round brackets, in the relevant phonetic section, i.e. with finals 141 to 145. Forms such as 'giên', 'giêng' appear only in the relevant phonetic section, i.e. with finals 47 to 53, not under the 'ê' spellings which might be misleading, since NV **z**, SV **j** > 'gi' never occur before the vowel **e**.[9]

To the right of each orthographic final appears in brackets the maximum number of tones theoretically possible for a syllable with such a final, and to the right of that again a phonetic rendering of its pronunciation, without tonal indications. For syllables ending with a continuant the maximum number of tonal possibilities is 6 for NV, 5 for SV, while for both dialects the maximum for syllables ending with a stop is 2. At the intersection of vertical column and horizontal line is shown the number of tones upon which a given syllable is found: thus, the number 3 at the intersection point of column 12 and line 31 in the NV table means that a syllable spelt 'men' is recorded as occurring on 3 tones out of a theoretical maximum of 6.

The system of phonetic transcription used is based upon that of the International Phonetic Alphabet and is in the main self-explanatory, but the following points should be noted:

Initial Consonants **ɓ-** snd **ɗ-** are glottalized, but not implosive; **ɗ-** is

alveolar in NV, post-alveolar and retroflex in SV. **th-** and **t-** are dental. NV **z** and **s** are alveolar. SV **ʃ** is slightly retroflex with narrowing in the alveolar or post-alveolar region; SV **s(j)** is a fronter, non-retroflex fricative, sometimes palatalized so that a light palatal off-glide is heard. SV **(b)j** is a laxly articulated bilabial plosive followed by a palatal fricative. In connected speech frequently the fricative only is pronounced. (ʔ) indicates that a glottal plosive may occur at the beginning of the syllables so marked. **l-** and **n-** are alveolar in NV, post-alveolar and slightly retroflex in SV in most contexts. In **ɲ-** the sides of the front of the tongue are raised and approach each other in the palato-alveolar area, sometimes meeting in the middle so that palatograms may show a wipe right across the palate. NV **ch**, which is lightly aspirated, is similarly articulated, but palatograms never show a wipe right across the palate. Palatograms of SV **c**, which is unaspirated, show post-alveolar narrowing caused by the raising of the sides of the tongue, and sometimes show a wipe right across the palate in this area. SV **tɹ** is a retroflex affricate, **ɹ** a post-alveolar fricative, SV **j** < 'gi' has strong friction in adagio speech, **j** < 'd' is always frictionless.

Final Consonants **-p**, **-t**, and **-k** are unexploded. NV **-t** and **-n** are alveolar, the contact for **-n** being commonly rather further back than for initial **n-**. **-k̟** and **-ŋ̟** are fronted velars.[10] SV **-t** is alveolar or post-alveolar and retroflex. SV **-n** is post-alveolar and markedly retroflex. SV **-k** is further back than NV **-k**, frequently uvular. **-k͡p̚** and **-ŋ͡m̚** indicate simultaneous velar and bilabial articulations.

Vowels. All Vietnamese vowels vary considerably as to the degree of opening according to the tone of the syllable in which they occur. In the tables the pronunciation indicated is based upon that appropriate to the 'bằng' and 'sắc' tones, i.e. the closest of the variants. There is also variation in the degree of centralization and diphthongization correlated with consonantal articulations in the syllable and sometimes with tone. An attempt is made to indicate this in the phonetic transcription where it appears relevant to the phonolgical analysis. **ɨ**, **ë**, and **ɛ̈** are centralized vowels, slightly fronter than **i**, **ə**, and **ɐ**. NV **ɯ** and **ɤ** are generally fronter than SV **ɯ** and **ɤ** and somewhat closer in most contexts. NV **ə** is between SV **i** and **ə**. SV **a** is very front, NV **a** is central. SV **ʌ** is a half-open back unrounded vowel.

When the material was being collected, dictionaries were sometimes referred to and the informant's reaction to forms recorded there sometimes sought. The aim, however, in compiling the lists was to record only those forms known to and used by the informant himself. As

Emeneau has pointed out,[11] dictionaries are of limited use for this purpose as most of them contain many highly literary Sinicized forms unfamiliar even to educated speakers of the language. In my experience, they also appear sometimes to contain forms which can only be accounted for as dialectal mis-spellings.[12] Examination of the pronunciation columns in the tables will show how readily such mis-spellings can arise. SV does not distinguish in pronunciation finals ending in 'n' and 'ng', 't' and 'c', except after 'ô' and 'o', and SV speakers are in consequence frequently uncertain as to their spelling. My Southern informant when called upon to record the incidence or absence of the relevant finals, felt obliged in most cases to treat them as single forms except in the case of 'ươc' and 'ươt', about the spelling of which he appeared to have no doubts. Conversely, NV does not distinguish initial 'tr' and 'ch', or initial 'd', 'r', and 'gi' in colloquial style, and so mis-spellings sometimes arise. Orthographic forms which were readily recognized by my informants as 'mis-spellings' such as 'hoéc' for 'hoét', 'khuyếc' for 'khuyết', etc., have been omitted in the tables, and the syllables entered under the regular spellings.[13] Similarly, orthographic sequences which were immediately rejected as non-occurrent such as 'ei', 'ou', 'iei', etc., are not included, but others which were accepted as possible forms by my informants, but which turned out upon investigation to be non-occurrent, such as '-uôp', '-ơc', '-ơng', are included.

It is not claimed that the syllable count itself is exhaustive or without error but it is believed that it reflects a fair picture of the points at issue. The tables derive in the main from a single informant for each dialect, though the pronunciation of the Northern dialect has been checked with upwards of half a dozen other speakers, and that of the Southern with two or three. The Northern material was worked over more thoroughly and for a longer period of time than the Southern material and is for this reason likely to be more reliable. The Southern material is incomplete[14] but is included as displaying some interesting points of difference to the Northern material, which, while often posing new problems for solution, sometimes suggest helpful lines of approach to those of the sister dialect. In pronouncing syllables in isolation, my Southern informant sometimes produced pronunciations which did not, so far as my observations went, occur in more natural speech. Such forms, which are suspected to be spelling pronunciations only, are enclosed in round brackets in the tables after what is believed to be his natural pronunciation.

TABLE A

NORTHERN

Spelling		1	2 b	3 c, k	4 ch	5 d	6 đ	7 g(h)	8 gi	9 h	10 kh	11 l	12 m	13 n	14 ng(h)	15 nh	16 ph	17 qu	18 r	19 s	20 t	21 th	22 tr	23 v	24 x
Pron:		(?)	ɓ	k	ch	z	ɗ	ɣ	z	h	x	l	m	n	ŋ	ɲ	f	kw	z	s	t	th	ch	v	s
1 a	(6) a	4	4	4	4	5	5	4	6	4	3	6	6	6	4	5	4	4	6	5	6	3	5	5	6
2 ac	(2) a : k	1	2	1	2	1	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2
3 ach	(2) ăiķ	1	2	2	1	0	0	1	0	2	1	2	2	1	2	2	1	2	2	2	2	2	2	2	2
4 ai	(6) a : i	3	4	5	4	6	5	4	4	6	4	5	6	5	6	6	3	5	4	5	5	5	4	6	3
5 am	(6) a : m	2	1	3	2	1	4	0	3	4	3	5	1	4	0	4	2	0	5	3	4	4	4	0	5
6 an	(6) a : n	2	5	5	3	2	4	2	5	5	2	3	5	5	3	4	5	4	5	5	5	3	6	5	2
7 ang	(6) a : ŋ	1	3	5	2	4	5	3	4	6	1	6	6	5	4	4	3	6	5	4	5	2	5	6	2
8 anh	(6) ăiŋ	3	3	5	4	2	4	2	2	5	3	6	6	4	3	3	2	4	4	4	5	5	4	2	2
9 ao	(6) a : u	3	6	5	5	4	5	3	3	5	5	6	4	5	4	5	3	3	6	5	5	5	5	2	5
10 ap	(2) a : p	1	0	1	1	0	1	0	1	1	2	2	0	2	1	2	2	0	2	2	2	2	1	0	2
11 at	(2) a : t	0	2	1	2	2	0	1	1	2	1	2	2	2	2	2	2	2	2	2	2	0	2	2	1
12 au	(6) au	0	0	2	2	1	2	1	2	2	1	4	3	1	3	3	1	3	4	2	3	2	3	0	3
13 ay	(6) ai	1	1	4	5	6	5	4	2	2	2	4	4	6	3	4	3	3	6	3	3	4	2	3	2
14 ăc	(2) ak	0	1	2	1	2	2	1	1	1	1	2	1	1	1	1	1	2	2	2	2	1	2	0	1
15 ăm	(6) am	1	3	3	3	2	5	3	2	3	2	4	3	3	3	5	0	3	4	3	3	3	3	1	2
16 ăn	(6) an	1	2	3	4	4	2	2	2	3	3	5	5	4	3	5	1	4	4	4	3	5	2	3	4
17 ăng	(6) aŋ	1	0	2	4	2	4	2	1	3	4	5	3	4	1	5	2	6	3	3	3	4	6	6	3
18 ăp	(2) ap	0	0	2	2	0	1	2	0	0	1	2	2	1	0	1	0	2	1	1	1	1	1	2	1
19 ăt	(2) at	0	0	1	2	1	2	2	2	1	1	2	2	0	2	2	1	2	0	2	1	1	2	2	1
20 âc	(2) ək	0	2	0	0	0	0	1	1	0	1	1	1	1	0	1	0	1	1	0	1	0	0	2	1
21 âm	(6) əm	4	4	5	4	3	5	4	3	5	3	5	6	4	6	5	1	0	5	5	4	6	5	3	3
22 ân	(6) ən	3	4	5	3	4	2	2	2	2	0	6	6	3	5	3	6	6	4	3	6	4	6	6	1
23 âng	(6) əŋ	0	1	2	1	1	1	1	1	2	0	3	2	4	1	1	1	1	1	2	3	0	1	3	1
24 âp	(2) əp	1	0	2	2	1	1	2	2	1	1	2	1	1	1	2	2	0	2	2	2	2	2	2	1
25 ât	(2) ət	0	2	2	2	1	2	1	0	1	2	2	2	0	2	2	2	2	1	0	2	2	2	2	0
26 âu	(6) əu	2	4	5	4	4	5	2	3	5	3	4	6	4	5	5	2	1	3	4	5	3	5	3	2
27 ây	(6) əi	1	5	4	4	5	6	5	4	0	0	5	4	4	4	5	0	5	3	5	3	3	2	6	1
28 e	(6) ɛ, ɛə	2	6	4	5	2	3	4	2	3	5	6	6	2	3	6	2	5	5	4	3	4	3	5	5
29 ec	(2) ɛk	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
30 em	(6) ɛm	1	0	4	1	1	2	1	1	1	1	4	2	2	0	4	0	0	1	1	2	2	0	0	1
31 en	(6) ɛn	1	2	3	3	0	2	1	0	3	2	4	3	1	2	1	2	3	3	4	1	2	0	5	3
32 eng	(6) ɛŋ	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
33 eo	(6) ɛu	3	2	5	4	1	4	1	2	4	2	6	5	3	4	5	2	5	3	4	2	3	4	2	5
34 ep	(2) ɛp	1	1	2	1	2	1	1	1	1	1	2	1	2	0	0	1	1	1	0	0	1	0	0	2
35 et	(2) ɛt	0	1	1	2	0	1	1	0	1	1	2	2	2	1	1	2	2	1	2	2	1	1	2	2
36 ê	(6) e	2	4	5	3	4	6	3	0	3	3	5	3	5	3	3	3	2	4	2	6	5	5	4	5
37 êch	(2) êiķ	1	1	1	2	1	1	2	0	0	0	2	1	0	2	0	2	1	1	0	1	1	2	2	2
38 êm	(6) em	1	0	1	2	3	3	0	0	1	0	0	1	3	0	0	0	0	0	0	1	2	4	0	0
39 ên	(6) en	0	3	0	0	2	2	0	0	0	2	3	3	4	0	1	1	1	3	3	1	0	2	1	1
40 ênh	(6) ẽiŋ	0	2	1	1	1	1	2	0	1	3	4	2	1	2	0	1	0	2	3	1	0	0	4	1
41 êp	(2) ep	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	0	2	0	0	2
42 êt	(2) et	0	0	1	2	1	0	0	0	2	0	2	1	1	0	0	2	2	2	2	1	1	0	2	0
43 êu	(6) eu	0	1	1	0	1	1	0	0	0	0	2	0	1	2	2	2	4	0	3	0	0	2	0	4
44 i, y	(6) i	4	5	5	5	6	2	2	3	3	4	3	6	5	5	6	5	6	6	6	6	6	5	6	6
45 ia	(6) iə	1	2	2	2	3	4	0	0	1	2	2	2	2	1	0	1	0	5	2	3	2	0	1	2
46 ich	(2) iiķ	2	1	2	1	2	2	0	0	0	1	1	2	2	1	1	2	0	1	1	2	2	1	0	2
47 iêc	(2) iək	0	0	0	1	2	1	1	1	0	0	1	0	0	0	1	0	0	2	1	2	1	0	1	0
48 iêm	(6) iəm	3	0	5	2	3	3	0	1	3	3	6	0	3	2	2	0	0	0	1	5	3	0	0	1
49 iên	(6) iən	2	4	3	2	3	4	1	1	5	3	5	4	2	4	2	4	4	3	2	6	4	2	5	3
50 iêng	(6) iəŋ	1	1	4	1	1	1	0	3	0	1	4	4	1	1	0	0	0	2	2	1	2	0	3	2
51 iêp	(2) iəp	0	0	2	1	1	1	0	0	2	1	2	0	0	0	0	0	0	1	0	1	2	1	0	0
52 iêt	(2) iət	1	2	2	1	1	0	0	2	0	1	1	1	2	1	1	1	2	2	1	2	2	2	2	1
53 iêu	(6) iəu	3	1	5	3	3	5	0	1	3	2	5	4	1	1	3	2	0	5	1	4	5	2	0	1
54 im	(6) im	2	0	2	3	3	0	1	0	1	0	2	2	0	0	1	1	2	3	1	5	1	2	1	0
55 in	(6) in	3	0	3	1	1	0	0	1	1	1	0	3	1	1	3	0	0	3	1	2	2	1	3	2
56 inh	(6) ĩiŋ	4	3	3	5	2	5	1	0	2	1	6	2	3	2	0	2	2	3	4	6	5	6	3	3

TABLE B

SOUTHERN

Spelling		1	2 b	3 c, k	4 ch	5 d	6 đ	7 g(h)	8 gi	9 h	10 kh	11 l	12 m	13 n	14 ng(h)	15 nh	16 ph	17 qu	18 r	19 s	20 t	21 th	22 tr	23 v	24 x
Pron:		(?)	ɓ	k	c	j	ɗ	ɣ	j	h	x	l	m	n	ŋ	ɲ	f	kw	ɹ	ʃ	t	th	tɹ	(b)j	s(j)
1 a	(5) a	5	5	5	5	3	5	5	5	5	4	5	5	4	4	4	3	5	5	5	5	4	4	5	5
2 ac	(2) a : k	2	2	2	2	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 ach	(2) ɐt	2	2	2	2	2	2	1	0	2	1	2	2	1	1	0	2	1	2	2	2	2	2	2	2
4 ai	(5) a : i	4	5	5	5	5	5	4	4	5	3	5	5	5	5	5	3	3	4	4	5	4	4	4	3
5 am	(5) a : m	2	1	4	2	1	4	0	3	5	3	5	1	2	1	4	2	0	2	5	4	4	3	1	4
6 an	(5) a : ŋ	3	5	5	5	2	5	4	5	5	4	5	5	5	3	5	4	3	5	5	5	3	5	5	3
7 ang	(5) a : ŋ	as for an																							
8 anh	(5) ɐn	3	5	5	5	3	4	4	2	5	2	5	5	2	3	3	2	3	5	5	4	5	3	4	2
9 ao	(5) a : u	4	5	5	4	3	5	3	3	5	4	5	5	5	4	5	3	2	4	5	5	5	5	1	4
10 ap	(2) a : p	2	0	2	1	0	2	0	1	2	2	2	1	2	1	1	1	0	2	1	2	1	0	0	2
11 at	(2) a : k	as for ac																							
12 au	(5) a : u	as for ao																							
13 ay	(5) a : i	as for ai																							
14 ăc	(2) ak	1	2	2	2	2	2	2	2	1	1	2	2	2	2	2	1	2	2	2	2	1	2	2	2
15 ăm	(5) am	3	5	5	5	5	5	5	1	2	1	5	2	4	5	3	0	0	4	5	4	5	4	1	2
16 ăn	(5) aŋ	1	4	5	4	3	4	4	2	4	5	5	5	4	3	5	2	5	4	4	5	5	3	5	4
17 ăng	(5) aŋ	as for ăn																							
18 ăp	(2) ap	1	2	2	2	2	2	2	2	2	1	2	2	2	1	2	1	0	2	2	2	2	1	2	2
19 ăt	(2) ak	as for ăc																							
20 âc[15]	(5) ʌk	1	2	2	2	2	2	1	2	1	1	2	2	1	2	2	2	2	2	2	2				
21 âm	(5) am, ʌm	4	5	5	5	5	5	5	0	2	1	5	3	2	5	4	1	1	5	5					
22 ân	(5) ʌŋ	3	5	5	5	3	1	2	1	2	3	5	4	2	4	4	5	3	4	3					
23 âng	(5) ʌŋ	as for ân																							
24 ăp	(2) ap, ʌp	as for ăp																							
25 ât	(2) ʌk	as for âc																							
26 âu	(5) au	3	4	5	3	5	5	1	1	2	2	4	5	4	3	3	1	1	2	2					
27 ây	(5) ii	2	5	4	3	3	5	4	4	1	2	5	4	2	3	3	1	2	3	3					
28 e	(5) ɛ	2	5	5	4	3	4	5	0	5	4	5	5	3	3	5	3	0	4	4	4	4	4	4	4
29 ec	(2) ɛək	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1
30 em	(5) ɛm	2	0	3	3	1	1	4	0	2	0	5	2	2	0	3	0	0	1	0	2	1	0	0	2
31 en	(5) ɛən	1	5	5	3	0	3	3	0	3	1	3	2	1	2	1	2	0	4	2	1	2	2	4	3
32 eng	(5) ɛəŋ	as for en																							
33 eo	(5) ɛu	3	3	4	4	1	4	0	1	3	1	4	4	3	1	3	2	0	2	1	4	2	4	1	4
34 ep	(2) ɛp	2	2	2	1	2	1	2	0	2	1	2	2	2	1	2	1	0	0	0	1	2	0	0	1
35 et	(2) ɛək	as for ec																							
36 ê	(5) e, ei	3	5	5	5	3	5	2	0	3	2	4	3	2	3	2	3	2	4	1	4	5	4	3	5
37 êch	(2) it, ət	1	2	1	2	1	0	0	0	2	0	1	1	0	0	0	1	2	0	2	1	1	1	1	2
38 êm	(5) em	2	0	1	1	0	3	0	0	0	0	0	1	3	0	0	0	0	1	0	1	2	0	0	0
39 ên	(5) ən	1	5	1	1	0	2	1	0	2	0	4	5	4	2	2	1	2	2	2	1	0	2	2	2
40 ênh[15]	(5) in, ən	as for ên																							
41 êp	(2) ep	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
42 êt	(2) ət	as for êch																							
43 êu	(5) eu	0	3	1	0	2	2	0	0	2	2	3	1	2	3	1	0	1	2	0	0	1	1	0	0
44 i, y	(5) i, ii	4	5	5	5	5	3	3	1	3	4	4	5	3	4	5	4	5	4	3	5	5	5	5	5
45 ia	(5) iə	1	3	4	5	1	4	0	0	1	2	4	3	2	1	0	1	0	3	0	3	3	1	1	3
46 ich	(2) it	2	2	2	2	1	2	1	0	1	2	1	2	2	1	1	1	2	2	0	2	2	2	2	2
47 iêc	(2) iək	1.	2	2	1	2	1	0	2	0	2	2	2	0	1	2	0	0	2	1	2	2	1	2	1
48 iêm	(5) im	4	1	5	4	3	3	2	0	2	2	5	2	2	3	2	1	0	1	0	4	2	1	1	1
49 iên	(5) iən	2	5	5	4	4	5	0	3	5	3	5	5	3	4	2	3	2	2	2	5	5	4	4	1
50 iêng	(5) iəŋ	as for iên																							
51 iêp	(2) ip	0	2	2	1	1	1	1	0	2	1	1	1	0	1	2	0	0	1	0	2	2	1	0	1
52 iêt	(2) iək	as for iêc (except after qu.) 2																							
53 iêu	(5) iu	3	2	5	5	5	5	1	0	4	3	5	3	2	1	4	2	0	5	1	5	5	4	1	4
54 im	(5) im	as for iêm																							
55 in	(5) in	3	5	4	4	3	5	0	1	4	2	5	5	3	3	4	2	0	4	3	5	5	4	5	5
56 inh	(5) in	as for in (except after qu.) 2																							

TABLE A *cont'd*

NORTHERN

Spelling	Pron:	1 (?)	2 b ɓ	3 c, k k	4 ch ch	5 d z	6 đ ɗ	7 g(h) ɣ	8 gi z	9 h h	10 kh x	11 l l	12 m m	13 n n	14 ng(h) ŋ	15 nh ɲ	16 ph f	17 qu kw	18 r z	19 s s	20 t t	21 th th	22 tr ch	23 v v	24 x s
57 ip	(2) ip	0	1	2	0	2	0	0	0	1	0	1	0	1	0	2	0	0	0	0	0	1	0	0	0
58 it	(2) it	2	2	2	1	2	2	1	0	1	1	0	2	2	0	0	0	2	2	2	2	2	0	1	2
59 iu	(6) iu	1	1	2	3	3	1	0	3	1	2	3	1	3	0	1	0	1	3	0	3	2	0	1	3
60 o	(6) ɔ, ɔə	3	5	5	3	4	5	3	4	3	3	4	6	6	6	4	3	0	6	4	3	5	5	6	3
61 oa	(6) wa	2	0	0	0	1	2	1	0	5	3	4	0	1	4	2	0	(4)	0	0	5	5	0	0	4
62 oac	(2) wa:k	2	0	0	1	0	1	0	0	1	1	0	0	0	2	0	0	(2)	0	0	2	0	0	0	1
63 oach	(2) wĕiḵ	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	(2)	0	0	0	0	0	0	0
64 oai	(6) wa:i	3	0	0	2	0	2	0	0	3	2	2	0	0	5	1	0	(5)	0	1	2	3	0	0	4
65 oam	(6) wa:m	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
66 oan	(6) wa:n	3	0	0	0	0	5	0	0	5	3	4	0	1	2	0	0	(4)	0	2	3	4	1	0	1
67 oang	(6) wa:ŋ	0	0	0	3	0	1	0	0	4	5	5	0	0	1	2	0	(6)	0	0	2	2	3	0	5
68 oanh	(6) wĕiŋ	1	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	(4)	0	0	0	0	0	0	0
69 oao	(6) wa:u	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	(3)	0	0	0	0	0	0	0
70 oap	(2) wa:p	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71 oat	(2) wa:t	0	0	0	0	0	1	0	0	1	1	2	0	0	1	0	0	(2)	0	1	1	2	1	0	1
72 oau	(6) wau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(3)	0	0	0	0	0	0	0
73 oay	(6) wai	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	(4)	0	0	0	0	0	0	2
74 oăc	(2) wak	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	(2)	0	0	0	0	0	0	0
75 oăm	(6) wam	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	(3)	0	0	0	0	0	0	0
76 oăn	(6) wan	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	(4)	0	0	0	1	0	0	3
77 oăng	(6) waŋ	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	(6)	0	0	0	1	0	0	0
78 oăp	(2) wap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(2)	0	0	0	0	0	0	0
79 oăt	(2) wat	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	(2)	0	0	0	1	1	0	0
80 oc	(2) aukp̄	2	2	0	2	2	1	1	1	2	1	2	2	2	2	2	1	0	2	2	2	2	2	1	2
81 oe	(6) wɛ	2	0	0	0	0	0	0	0	3	3	4	0	0	2	1	0	(5)	0	0	4	0	0	0	2
82 oem	(6) wɛm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83 oen	(6) wɛn	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	(3)	0	0	0	0	0	0	2
84 oeo	(6) wɛu	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	(5)	0	0	0	0	0	0	0
85 oep	(2) wɛp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(1)	0	0	0	0	0	0	0
86 oet	(2) wɛt	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	(2)	0	0	1	0	0	0	2
87 oi	(6) ɔi	3	1	5	4	2	2	3	3	3	2	5	5	3	3	2	0	0	6	5	3	3	4	3	2
88 om	(6) ɔm	2	1	1	1	3	2	1	0	4	2	6	4	1	2	4	0	0	6	3	3	3	4	1	2
89 on	(6) ɔn	1	3	2	2	3	2	2	1	3	1	4	5	4	4	4	0	0	4	2	3	3	3	4	2
90 ong	(6) auŋm̄	3	2	4	5	3	4	1	2	5	2	5	5	4	3	4	4	0	5	5	3	3	6	4	1
91 oong	(6) ɔŋ	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92 op	(2) ɔp	2	1	1	1	0	0	1	0	2	0	1	1	1	1	1	0	0	0	0	2	2	0	0	2
93 ot	(2) ɔt	2	1	1	1	0	0	2	1	1	0	2	2	0	2	2	1	0	2	2	1	2	2	2	1
94 ô	(6) o	4	5	5	1	2	6	1	3	5	3	6	5	5	4	4	3	0	6	6	4	4	4	5	4
95 ôc	(2) ɔukp̄	2	1	2	1	2	2	1	1	2	0	2	2	1	1	0	0	0	2	0	2	2	1	1	2
96 ôi	(6) oi	4	4	4	4	4	6	2	3	5	2	5	4	6	2	2	3	0	5	3	4	3	5	2	2
97 ôm	(6) om	2	0	2	2	0	1	2	0	2	0	4	1	3	1	2	1	0	1	1	1	0	1	0	3
98 ôn	(6) on	3	4	3	3	3	4	0	0	3	2	5	2	1	5	3	1	0	3	1	4	4	3	1	5
99 ông	(6) auŋm̄	2	5	5	4	2	4	2	3	3	3	4	6	4	3	4	4	0	6	4	3	2	4	3	4
100 ôp	(2) op	2	2	1	1	0	1	1	0	2	0	2	0	2	0	1	1	0	1	1	2	1	0	0	1
101 ôt	(2) ot	2	1	2	2	2	2	1	0	2	0	2	2	2	2	2	0	0	2	2	2	1	0	0	1
102 ơ	(6) ɤ	5	5	4	5	4	3	2	2	4	1	6	6	5	4	6	3	3	6	6	4	6	6	6	3
103 ơc	(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104 ơi	(6) ɤi	4	4	4	1	2	2	2	2	4	3	4	3	2	4	1	3	0	5	2	2	5	3	4	2
105 ơm	(6) ɤm	1	3	1	2	1	2	2	0	1	1	5	1	2	1	2	1	0	2	1	1	2	4	0	3
106 ơn	(6) ɤn	2	2	1	2	4	3	0	1	3	1	4	4	0	1	6	0	0	3	4	1	3	6	2	2
107 ơng	(6)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108 ơp	(2) ɤp	0	1	0	1	1	1	0	0	2	1	2	1	1	2	1	0	0	1	0	1	0	2	0	0
109 ơt	(2) ɤt	2	1	1	1	0	1	2	1	1	0	2	2	1	1	2	1	0	1	2	0	2	2	2	2
110 ơu	(6) ɤu	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
111 u	(6) u	4	3	6	3	3	3	1	0	4	3	5	6	2	5	4	6	0	6	5	5	5	4	5	6
112 ua	(6) uə	5	3	2	3	3	3	0	1	1	1	4	3	3	0	1	0	0	4	2	3	3	0	2	1

TABLE B *cont'd*

SOUTHERN

Spelling	Pron.	1 (?)	2 b ɓ	3 c, k k	4 ch c	5 d j	6 đ ɗ	7 g(h) ɣ	8 gi j	9 h h	10 kh x	11 l l	12 m m	13 n n	14 ng(h) ŋ	15 nh ɲ	16 ph ph	17 qu kw	18 r ɹ	19 s ʃ	20 t t	21 th th	22 tr tɹ	23 v (b)j	24 x s(j)
57 ip	(2) ip								as for iêp																
58 it	(2) it								as for ich																
59 iu	(5) iu								as for iêu									2							
60 o	(5) ɔ	2	5	5	3	3	5	3	4	3	4	5	5	5	5	3	3	0	3	4	3	4	4	4	4
61 oa	(5) wa	1	0	0	2	2	3	1	0	5	3	4	2	1	3	1	0	(5)	0	1	4	3	0	0	4
62 oac	(2) wa:k	0	0	0	0	1	1	0	0	2	1	2	0	0	1	0	0	(2)	0	1	2	2	0	0	1
63 oach	(2) wat	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	(1)	0	0	0	0	0	0	0
64 oai	(5) wa:i	2	0	0	0	0	3	0	0	4	2	2	0	0	3	1	0	(3)	0	1	0	1	0	0	3
65 oam	(5)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66 oan	(5) wa:ŋ	2	0	0	2	2	5	0	0	5	3	5	0	1	1	1	0	(3)	0	1	4	4	0	0	1
67 oang	(5) wa:ŋ								as for oan																
68 oanh	(5) wɐn	1	0	0	0	1	0	0	0	3	2	0	0	0	1	0	0	(3)	0	0	0	0	0	0	0
69 oao	(5)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(2)	0	0	0	0	0	0	0
70 oap	(2) wa:p	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71 oat	(2) wa:k								as for oac																
72 oau	(5)								as for oao																
73 oay	(5) wa:i								as for oai																
74 oăc	(2) wak	0	0	0	1	0	0	0	0	2	1	0	0	0	1	0	0	(2)	0	0	0	1	0	0	0
75 oăm	(5) wɐm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76 oăn	(5) waŋ	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	(5)	0	0	0	1	0	0	0
77 oăng	(5) waŋ								as for oăn																
78 oăp	(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79 oăt	(2) wak								as for oăc																
80 oc	(2) aukp̄	2	2	2	2	1	1	2	1	2	1	2	2	1	2	2	1	0	2	2	2	2	2	1	3
81 oe	(5) (w)ɛ	1	0	0	1	2	1	0	0	2	3	3	0	0	1	0	0	0	0	0	0	0	0	0	0
82 oem	(5)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83 oen	(5) wɛəŋ	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84 oeo	(5) wɛu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85 oep	(2) wɛp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86 oet	(2) wɛək	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0
87 oi	(5) ɔi	4	1	3	5	0	3	3	1	1	2	5	4	2	3	2	0	0	2	3	1	1	2	3	1
88 om	(5) ɔm	1	1	1	3	2	2	1	0	1	3	5	1	2	0	0	0	0	1	1	2	0	1	0	2
89 on	(5) ɔŋ	2	5	3	3	2	3	2	1	2	1	5	5	3	3	2	0	0	2	1	1	4	2	1	0
90 ong	(5) auŋm̄	2	4	5	3	2	2	2	3	4	0	5	5	2	3	2	4	0	3	1	2	3	4	4	2
91 oong	(5) ɔŋm̄	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
92 op	(2) ɔp	1	2	1	1	0	0	2	0	1	0	0	2	1	0	0	0	0	0	1	0	1	0	0	2
93 ot	(2) ɔk	1	2	2	2	0	2	2	1	1	1	2	2	0	2	2	0	0	1	2	1	2	2	0	2
94 ô	(5) o, ou	4	5	5	2	2	4	1	1	5	3	4	4	3	3	3	3	0	4	3	4	3	2	4	2
95 ôc	(2) aukp̄	1	2	2	1	1	2	2	1	2	1	1	2	1	1	1	0	0	1	0	2	1	1	0	1
96 ôi	(5) oi	3	3	5	1	2	5	3	0	5	2	5	4	5	2	2	1	0	3	1	3	3	5	2	2
97 ôm	(5) om	2	2	3	3	0	2	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	0	0
98 ôn	(5) oŋ	3	5	3	2	1	3	0	0	2	2	2	2	2	2	0	1	0	3	2	3	2	2	0	1
99 ông	(5) auŋm̄	3	4	5	4	2	4	3	3	3	2	3	5	4	4	3	2	0	3	3	3	5	1	1	1
100 ôp	(2) op	0	2	2	0	0	2	0	0	2	1	2	2	1	2	0	0	0	0	0	1	0	0	0	2
101 ôt	(2) ok	1	1	2	2	2	2	0	0	2	0	2	2	1	1	2	0	0	2	2	2	1	1	0	0
102 ơ	(5) ɤ, ʌɤ	5	5	4	5	4	5	1	3	4	3	4	5	4	4	5	3	3	3	5	4	5	5	5	2
103 ơc	(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104 ơi	(5) ɤi	1	4	4	1	0	2	1	3	3	4	3	2	4	1	1	1	0	2	2					
105 ơm	(5) ɤm	0	3	2	3	0	3	0	0	0	1	2	1	0	0	0	0	1	2	1	1	0	0	1	
106 ơn	(5) ɤŋ	2	2	2	3	1	2	1	1	3	1	4	3	0	0	1	0	0	3	2	3	0	4	0	0
107 ơng	(5)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108 ơp	(2) ɤp	0	2	0	2	0	2	0	0	2	1	2	0	2	0	2	0	0	0	0	0	0	0	0	2
109 ơt	(2) ɤk	2	1	1	1	0	1	1	0	2	0	1	0	0	2	2	1	0	1	2	0	1	2	2	1
110 ơu	(5)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 u	(5) u, ʊu	5	3	5	3	5	5	2	0	5	5	4	5	2	2	2	5	0	4	5	5	5	4	4	3
112 ua	(5) uə																								

TABLE A *cont'd* — NORTHERN

Spelling		1	2 b	3 c, k	4 ch	5 d	6 đ	7 g(h)	8 gi	9 h	10 kh	11 l	12 m	13 n	14 ng(h)	15 nh	16 ph	17 qu	18 r	19 s	20 t	21 th	22 tr	23 v	24 x
Pron:		(ʔ)	ɓ	k	ch	z	ɗ	ɣ	z	h	x	l	m	n	ŋ	ɲ	f	kw	z	s	t	th	ch	v	s
113 uâc	(2)	wək	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(1)	0	0	0	0	0	0	0
114 uâm	(6)	wəm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115 uân	(6)	wən	1	0	0	1	0	0	0	2	2	2	0	0	0	3	0	(6)	0	0	3	4	1	0	2
116 uâng	(6)	wəŋ	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	(1)	0	0	0	0	0	0	0
117 uâp	(2)	wəp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118 uât	(2)	wət	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	(2)	0	1	1	1	2	0	1
119 uâu	(6)	wəu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(1)	0	0	0	0	0	0	0
120 uây	(6)	wəi	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	(5)	0	0	0	0	0	0	0
121 uc	(2)	uk	2	1	2	2	0	2	1	1	2	1	2	2	2	2	2	0	2	2	2	2	2	1	2
122 uê	(6)	ue	2	0	0	0	0	0	0	4	1	0	0	0	1	2	0	(2)	0	0	2	2	0	0	2
123 uêch	(2)	uēiḳ	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	(1)	0	0	2	0	0	0	0
124 uênh	(6)	uēiŋ	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	(0)	0	0	0	0	0	0	0
125 ui	(6)	ui	5	3	4	3	0	3	1	2	2	1	5	5	3	2	2	3	0	4	3	4	5	2	2	4
126 uinh, uynh	(6)	uīiŋ	1	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	(2)	0	0	0	0	0	0	0
127 uit, uyt	(2)	uit	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	(2)	0	0	0	0	0	0	1
128 um	(6)	um	5	1	3	4	0	1	0	2	2	2	5	0	1	2	1	0	0	4	4	4	3	3	1	2
129 un	(6)	un	3	3	2	3	0	2	0	2	2	0	6	4	1	3	2	3	0	4	3	1	3	2	2	2
130 ung	(6)	uŋ	3	2	5	5	0	4	0	0	4	4	6	2	3	1	5	5	0	6	5	4	6	6	4	2
131 uôc	(2)	uək	0	1	2	0	0	1	2	0	0	0	2	0	1	0	1	0	1	0	0	2	0	0	0	0
132 uôi	(6)	uəi	0	3	2	3	1	3	0	0	0	0	1	4	2	2	0	0	0	4	1	1	0	0	0	1
133 uôm	(6)	uəm	0	1	0	1	0	0	0	0	0	0	2	1	1	0	3	0	0	1	0	1	0	0	0	0
134 uôn	(6)	uən	1	2	2	1	0	0	0	0	0	1	2	3	0	1	0	0	0	0	1	1	2	0	0	0
135 uông	(6)	uəŋ	2	2	2	3	2	1	1	0	2	2	3	4	1	0	0	1	0	3	2	2	2	2	1	4
136 uôp	(2)	uəp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137 uôt	(2)	uət	0	1	0	2	1	1	1	0	0	0	2	1	2	0	1	0	0	2	1	2	1	0	2	0
138 uơ	(6)	wɤ	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	(3)	0	0	0	1	0	0	0
139 up	(2)	up	2	1	2	2	0	0	0	1	2	0	1	2	1	2	0	2	0	0	1	0	0	0	0	2
140 ut	(2)	ut	2	1	2	2	0	2	0	0	2	0	2	2	1	2	2	1	0	2	2	1	2	2	2	2
141 uy	(6)	ui	3	0	0	1	2	0	0	0	3	1	2	0	0	3	1	0	(6)	0	2	5	4	3	0	1
142 uya	(6)	uiə	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143 uyên	(6)	uiən	1	0	0	5	1	0	0	0	4	3	2	0	0	4	2	0	(4)	0	2	4	2	2	0	2
144 uyêt	(2)	uiət	0	0	0	0	1	0	0	0	2	1	0	0	0	0	0	0	(2)	0	0	2	1	0	0	0
145 uyu	(6)	uiu	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146 ư	(6)	ɯ	3	1	6	4	5	0	0	2	3	3	6	1	2	4	4	0	0	0	5	5	5	5	0	4
147 ưa	(6)	ɯə	2	5	5	5	4	2	1	2	2	1	5	4	4	1	0	0	6	5	1	4	1	4	1	1
148 ưc	(2)	ɯk	2	2	2	2	2	2	0	0	2	0	1	2	2	1	1	1	0	2	2	2	2	0	2	1
149 ưi	(6)	ɯi	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 ưm	(6)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
151 ưn	(6)	ɯn	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152 ưng	(6)	ɯŋ	3	2	3	4	3	3	1	0	4	1	6	2	4	4	3	2	0	4	4	6	3	4	4	4
153 ươc	(2)	ɯək	1	1	1	1	1	1	0	0	0	1	1	0	2	2	1	1	0	1	0	2	2	1	1	2
154 ươi	(6)	ɯəi	1	1	3	1	1	0	0	0	0	1	4	2	0	2	2	0	0	6	2	2	0	0	0	1
155 ươm	(6)	ɯəm	3	3	1	0	0	1	3	0	2	1	2	1	2	0	0	0	0	2	0	3	0	0	0	0
156 ươn	(6)	ɯən	2	0	0	0	0	0	0	0	1	0	3	2	0	0	0	2	0	2	2	0	0	1	3	0
157 ương	(6)	ɯəŋ	1	1	4	4	3	3	2	3	4	1	5	2	2	3	4	5	0	3	3	5	5	5	4	3
158 ươp	(2)	ɯəp	1	0	1	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0
159 ươt	(2)	ɯət	1	0	0	1	0	0	0	0	0	1	2	1	0	0	0	0	0	1	1	0	2	1	1	0
160 ươu	(6)	ɯəu*	0	1	0	0	0	0	0	1	1	1	1	0	0	0	1	0	1	0	1	0	0	0	0	0
161 ưp	(2)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162 ưt	(2)	ɯt	0	1	1	0	2	1	0	2	0	0	1	1	1	0	2	1	0	2	2	0	0	0	1	0
163 ưu	(6)	ɯu	1	0	5	0	0	0	0	0	3	1	3	1	1	1	0	1	0	0	2	2	0	2	0	0

* Pronounced iəu by many speakers, but not by my two principal informants.

TABLE B *cont'd* — SOUTHERN

Spelling		1	2 b	3 c, k	4 ch	5 d	6 đ	7 g(h)	8 gi	9 h	10 kh	11 l	12 m	13 n	14 ng(h)	15 nh	16 ph	17 qu	18 r	19 s	20 t	21 th	22 tr	23 v	24 x
Pron.:		(ʔ)	ɓ	k	c	j	ɗ	ɣ	j	h	x	l	m	n	ŋ	ɲ	ph	kw	ɹ	ʃ	t	th	tɹ	(b)j	s(j)
113 uâc	(2)	wək	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	(2)	0	0	1	1	1	0	1
114 uâm	(5)	wəm	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	(1)	0	0	0	0	0	0	0
115 uân	(5)	wiŋ	1	1	0	1	0	0	0	2	1	2	0	0	0	2	0	(3)	0	0	3	4	1	0	1
116 uâng	(5)	wiŋ							as for uân																
117 uâp	(2)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118 uât	(2)	wək							as for uâc																
119 uâu	(5)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 uây	(5)	wii	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	(2)	0	0	0	0	0	0	0
121 uc	(2)	uk	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	0	2	2	2	2	2	2	2
122 uê	(5)	we	2	0	0	0	1	0	0	0	4	1	0	0	0	1	2	0	(2)	0	0	2	0	0	2
123 uêch	(2)	wit	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	(2)	0	0	0	0	0	0
124 uênh	(5)	wən, win	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
125 ui	(5)	ui	3	5	5	4	4	5	2	0	2	1	5	5	3	3	3	3	0	4	2	4	4	3	2	5
126 uinh, uynh	(5)	win	1	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	(2)	0	0	0	0	0	0	0
127 uit, uyt	(2)	wit	1	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	(2)	0	1	0	0	0	0	1
128 um	(5)	um	3	4	4	4	3	2	0	1	1	1	3	1	2	0	2	0	0	2	2	4	2	3	0	2
129 un	(5)	uŋ	3	5	5	3	5	4	0	2	3	2	5	4	3	3	3	4	0	2	3	5	5	4	4	1
130 ung	(5)	uŋ							as for un																
131 uôc	(2)	uək																							
132 uôi	(5)	ui							as for ui																
133 uôm	(5)	uəm																							
134 uôn	(5)	uəŋ																							
135 uông	(5)	uəŋ																							
136 uôp	(2)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137 uôt	(2)	uək																							
138 uơ	(5)	wɤ	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(3)	0	0	0	0	0	0	0
139 up	(2)	up	2	2	2	1	0	0	0	1	2	0	0	1	1	0	0	0	0	1	1	0	0	0	0	2
140 ut	(2)	uk							as for uc																
141 uy	(5)	wi	3	0	0	1	1	0	0	0	3	2	2	0	0	2	1	0	(5)	1	5	3	3	0	1	5
142 uya	(5)	iə	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143 uyên	(5)	wiəŋ	2	0	0	5	1	0	0	0	4	3	2	0	0	3	0	0	(2)	0	0	4	2	2	0	2
144 uyơt	(2)	wiək	0	0	0	0	1	0	0	0	2	1	0	0	0	1	0	0	(2)	0	0	2	1	0	0	0
145 uyu	(5)	iu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(2)	0	0	0	0	0	0	0
146 ư	(5)	ɯ, ɣɯ	3	2	5	4	3	2	0	1	4	2	3	0	2	4	3	0	0	4	5	5	5	0	3	
147 ưa	(5)	ɯə	2	4	4	4	5	2	0	3	1	1	4	3	1	4	1	0	0	2	2	4	2	1	2	1
148 ưc	(2)	ɯk	1	1	1	1	1	1	0	1	0	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1
149 ưi	(5)	ɯi	0	3	4	1	1	0	1	0	1	2	3	1	0	3	0	1	0	2	2	2	0	0	0	1
150 ưm	(5)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
151 ưn	(5)	ɯŋ	3	3	2	5	4	3	1	0	4	1	3	2	4	2	2	1	0	3	4	4	2	3	3	4
152 ưng	(5)	ɯŋ							as for ưn																
153 ươc	(2)	ɯək	1	2	1	2	1	2	0	0	1	0	2	0	1	2	0	1	0	1	0	2	2	1	0	2
154 ươi	(5)	ɯi							as for ưi																
155 ươm	(5)	ɯəm	1	3	1	0	0	1	0	1	0	2	0	0	0	0	0	0	2	0	1	0	0	0	0	0
156 ươn	(5)	ɯəŋ	2	2	3	3	4	2	2	3	4	1	4	4	2	2	3	3	0	4	4	5	4	5	4	4
157 ương	(5)	ɯəŋ							as for ươn																
158 ươp	(2)	ɯp	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0
159 ươt	(2)	ɯək	1	0	0	0	1	0	0	0	1	2	2	0	0	0	0	0	1	1	0	1	0	1	0	0
160 ươu	(5)	ɯu	1	3	5	0	0	0	0	3	2	2	2	0	1	0	0	0	1	2	2	0	1	0	0	
161 ưp	(2)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
162 ưt	(2)	ɯk							as for ưc																
163 ưu	(5)	ɯu							as for ươu																

The Problems

Below are listed the principal problems raised for the phonologist by the material summarized in the preceding section:

1. The numerical disparity between the consonants found in syllable initial position and those found in syllable final position, and the relations between them.[16]

2. (i) The seemingly irregular patterning of initial unaspirated plosives whereby, though **t** and **đ** both occur, the voiced bilabial has no voiceless congener, and the voiceless velar no voiced congener; (ii) the phonological significance of the fact that **ɓ** and **ɗ** are glottalized rather than plain voiced plosives; and (iii) the absence of a corresponding velar glottalized plosive.[17]

3. The uneven distribution of initial consonants before a following bilabial semivowel. (See finals 61–79, 81–86, 113–120, 122–124, 126–127, 138, 141–145.)[18]

4. The relative infrequence of such initials as 'gi-', 'g(h)-', 'ph-' and of zero initial, as compared with others such as 'c, k-', 'l-' and 't-'.

5. The non-occurrence of 'ă' and 'â' in open syllables.[19]

6. (i) The relative shortness everywhere of the vowels spelt 'ă' and 'â'; (ii) the relative length of the vowels spelt 'a', 'ơ', 'e' and 'o' in closed syllables in general as against those spelt 'i', 'u', and 'ư'; (iii) the centring diphthongs found in contextual variation with NV **ɛ** and **ɔ** in open syllables, and the closing diphthongs found in free variation with SV **i**, **e**, **u**, **ɤ**, and **o** in open syllables.[20]

7. (i) The absence in NV of diphthongs beginning with a front vowel and moving towards a closer front vowel, and of diphthongs beginning with a back rounded vowel and moving towards a closer back rounded vowel; (ii) the occurrence in both dialects of diphthongs beginning with sounds represented by 'a', 'ă' and 'â' and moving towards both close front and close rounded back vowels; (iii) the patchy distribution of the finals 'ơi', 'ơu', 'ưi', 'ưu', 'ươu', and 'ươi' as compared with those discussed under (ii) above.[21]

8. (i) The distribution of post-alveolar and velar finals in SV and (ii) the central quality of the SV vowels spelt 'i', 'ê' and 'a' before post-alveolar finals.[22]

9. The pronunciation and phonological interpretation in NV of (i) finals ending in '-ch' and '-nh' and (ii) the finals '-ec' and 'eng'.[23]

10. The pronunciation and phonological interpretation in both dialects of (i) the finals 'oc', 'ong', 'ôc' and 'ông', and (ii) of 'oong'.[24]

11. The distribution of vowels after labial semivowels. (See finals cited under Problem 3.)[25]

12. The uneven incidence of final consonants and of diphthongs in syllables containing a labial semivowel. (See finals 62–79, 81–86, 126–127, 142–145.)[26]

13. Certain seeming discrepancies in the association of vowels and final consonants, e.g. (i) the non-occurrence of 'ơng' and 'ơc'; (ii) the rare occurrence of 'ưn' and non-occurrence of 'ưm' and 'ưp'; (iii) the non-occurrence of 'uôp'.[27]

14. Certain seeming discrepancies, other than those already noted under Problems 3 and 13, in the association of initials and finals, e.g. (i) the limitation of initial consonants before **ɯ** in open syllables; (ii) the rare occurrence of **ɣ** before close vowels or diphthongs beginning with a close vowel; (iii) the non-occurrence of 'gi-' in syllables containing the half-close front vowel **e**; (iv) the frequency, as compared with other consonant sounds, with which **k** appears before a following semivowel; (v) the restriction, especially puzzling in the light of (iv) above, of initial consonants occurring before the finals **ɥe**, **ɥiə** and **ɥiu** to **x** only in NV.[28]

15. The tones and their relation to initials and finals.

16. The very free use made of certain sounds, e.g. initial **k** and the vowel **a:**, as contrasted with others. (There are, for example in NV more than three times as many syllables beginning with **k** as there are syllables beginning with **ɣ**, and three-and-a-third times as many syllables containing the vowel **a:** as there are syllables containing the vowel **e**.)

The remainder of this paper will be devoted to an exploratory examination of a number of the above problems in the light of prosodic theory. Space does not permit the investigation here of the last two problems listed. It may be mentioned in passing, however, that a tentative essay, inspired by Haudricourt's historical thesis,[29] at a prosodic statement to handle Problem 15 appeared encouraging enough to warrant more detailed treatment at a later date. Problem 16 suggests that an attempt to re-state the phonetic exponents of the phonological categories posited in the succeeding section in acoustic terms would be rewarding and might prove more satisfactory than the articulation-based phonetic descriptions adopted here.

Exploratory Statement

As the starting point of our exploratory statement let us take Firth's view that the facts of the phonological structure of a language 'are most economically and most completely stated on a polysystemic hypothesis'[30] by means of a 'plurality of systems of interrelated phonematic and prosodic categories'.[31] We shall thus not find it necessary to postulate one all-embracing phonological system for all the forms of the language, regardless of their origin or function, nor shall we feel constrained to identify systems of units appropriate to one place in structure with systems appropriate to another place in structure. The immediate consequence of this standpoint is, as we shall see later, that Problems 1 and 9 cease to exist.

As a second step, it is accepted that each of the utterances of Vietnamese syllables which form the basis of this investigation constitutes 'one complete act' of speech behaviour, 'a configuration of bodily postures and movements not easily dissected'.[32] For the purposes of phonological analysis, the Vietnamese syllable is here regarded as a structure having 'places'[33] for which systems of phonematic units will be stated, and certain properties characteristic of the syllable as a whole for which prosodic systems will be stated.[34] These properties include such syllable-marking features as tone, and initial, final and medial characteristics which may be referred on the phonetic plane to such phenomena as labialization, palatalization and other manifestations of what Firth called the 'broad distinction of front and back resonance'.[35] Prosodic elements are not regarded as being placed, though they may be referred to one or more 'focal points' in the utterance.[36] Structures are of two or three places. All syllables are regarded as having a syllabic nucleus which is associated with the first place in a two-place structure and the second place in a three-place structure. From the phonic data set out on pp. 168–173 features will be selected as characteristic exponents of terms in systems of phonematic units referable to places in structure and of terms in prosodic systems referable to the syllable as a whole.[37] Such exponents may be 'continuous or discontinuous, discrete or cumulative'.[38] In order to avoid possible confusion between the phonetic and phonological levels of analysis, the terms *consonant* and *vowel* will be reserved for the language of phonetic description. In phonological statements reference will be to *nuclear*, *pre-nuclear* and *post-nuclear phonematic units*, symbolized in Greek fount, and to *prosodies*, symbolized by superior Roman or Roman-based letters.[39]

Since in setting up phonological categories the aim will be to demonstrate syllable structure in terms of 'the mutual expectancy of the parts and the whole' rather than as a 'unidirectional sequence of successive linear segments',[40] it should cause neither surprise nor dismay that the accepted language of phonetic description is frequently ill-suited to the description of the phonetic exponents of such categories, and that new categories of phonetic description are called for.[41]

Problem 1. Approached by way of the polysystemic hypothesis adopted here, this problem, which is common to all languages of the Sino-Tibetan linguistic area in which there are syllables with final consonants, is, in fact, not a problem in phonological terms. The consonantal articulations at the beginnings and ends of syllables are handled partly as exponents of terms of phonematic systems set up in the marginal places in structure, and partly as exponents of terms of prosodic systems. Since there is no particular reason why we should expect the same number of terms in each phonematic system any numerical disparity between them need not concern us.[42] Once it is decided to postulate separate systems for each place in structure the problem ceases to exist. It will, moreover, be found that in the marginal phonematic systems proposed in this paper the ratio of terms is 5:3, which is not by any reckoning a disturbing disparity.

Problems 2, 3 and *4.* To handle the problems raised by the nature and distribution of the initial consonants we shall be concerned with prosodic systems of syllable onset and of onset modification, and, in three-place structures, with the pre-nuclear phonematic system. To take the latter first, it is suggested that it should be conceived of not as referable to phonetic categories relating to the place and manner of articulation and the action of the larynx but to broad articulation types only. For the phonematic commutation system in place one of three-place structures five terms are postulated, as shown below:

Terms	*Phonetic Exponents*
δ	Tense phonation involving complete stoppage of the airstream, followed on release by rapid onset of the following vowel without perceptible intervening breathiness or friction.
ψ	Rather lax phonation with open glottis, involving either complete or partial obstruction of the air-

Terms	*Phonetic Exponents*
	stream followed by slow release, with breathy or fricative onset to the following vowel.
μ	Voiced nasal articulation, i.e. with soft palate lowered and vocal cords brought together to allow continuous escape of voiced air through the nose.
σ	Fricative articulation with marked hissing or buzzing effect. As contrasted with ψ, breath may be either voiced or unvoiced, and there is never complete obstruction of the airstream.
ρ	Voiced oral continuant articulation, with or without perceptible friction.

Associated with the phonematic system in place one are certain syllabic features proper to syllable onset which are stated as a prosodic system of four terms, *dark*, *clear*, *neutral*, and *mixed*, as follows:

Terms		*Phonetic Exponents*
Dark	(w)	Labial or back articulation.
Clear	(y)	Dental, or alveolar apical articulation, produced with the blade of the tongue flat, or dorsal articulation with the front part of the tongue raised towards the hard palate.
Neutral	(ə)	Absence of labiality and of dental or palatal articulation. Typical neutral articulations are (a) either with the tongue tip lowered and the back of the tongue raised towards, or to touch, the soft palate, or (b) with more retracted apical contact than for clear syllables and slightly grooved dorsum.[43]
Mixed (Clear and Dark)	(yw)	Absence of labiality, or dental or palatal articulation, and of the tip-down articulation described for neutral syllables at (a) above. A typical mixed articulation is slightly retroflex, with the tongue tip in contact with or in close proximity to the post-alveolar region.

The initial consonants of Tables A and B on pp. 168–173 may now be interpreted as the cumulative phonetic exponents of pre-nuclear phonematic units and syllable onset prosodies, as follows:[44]

TABLE C

Syllable-onset Prosodies		*Phonematic Units*				
		δ	ψ	μ	σ	ρ
Dark	(w)	**ɓ**	SV **ph** NV **f**	**m**	SV **j** < 'gi' NV **z** < 'gi'	**ɣ**
Clear	(y)	**t**	**th**	**ɲ**	SV **s(j)** NV **s** < 'x'	SV **j** < 'd' NV **z** < 'd'
Neutral	(ə)	**k**	**x**	**ŋ**	**h**	**l**
Mixed	(yw)	**ɗ**	SV **tɪ** NV **ch** 'tr'	**n**	SV **ʃ** NV **s** < 's'	SV **ɪ** NV **z** + 'r'

It is here assumed that, providing there are sufficiently cogent linguistic reasons for postulating different elements of phonological structure in a given case, the phonetic exponents of such elements may sometimes converge in what is, from the point of view of general phonetic description, an identical complex of phonetic features. Thus, working from the table above, it may be said that there is convergence of the cumulative phonetic exponents of NV $^{w}\sigma$, $^{y}\rho$ and $^{yw}\rho$; of NV $^{y}\sigma$ and $^{yw}\sigma$; and of SV $^{w}\sigma$ and $^{y}\rho$. The justification for the phonological distinction between SV $^{w}\sigma$ and $^{y}\rho$ lies in the difference observed in the adagio pronunciation of SV 'gi-' and 'd-',[45] and in their occurrence before **w**.[46] Similar considerations, which will be noted in later sections of the text, support the distinction between the NV elements cited.

While there appears to be no serious theoretical objection to the concept of the convergence of the phonetic exponents of phonological categories, the converse hypothesis, i.e. that there may be divergence of the phonetic exponents of the same phonological elements, is only acceptable if the conditions determining such divergence can be stated. It has sometimes been necessary in working through the present material to choose between phonological solutions entailing some convergence or divergence of phonetic exponents. Except in cases where the conditions for divergence were readily discernible, or where strict avoidance of divergence would lead to the postulation of convergence on a very widespread scale, preference has always been given to a solution entailing the statement of some convergence of phonetic exponents.

To return to the problems under consideration, it will be seen from the

display of cumulative exponents in Table C on p. 179 that Problem 2 is now resolved to the extent that the system proposed does not require that there should be pairs of voiced and voiceless unaspirated plosives, nor that the phonological relations that obtain between **t** sounds and **d** sounds in other language systems should obtain here.[47] $^{yw}\delta$ is related to $^{y}\delta$ through its clear prosodic component and to $^{w}\delta$ through its dark prosodic component. Carrying this a little further, it may perhaps be suggested that the apical articulation of **đ** is a phonetic exponent of the y-element in the yw- prosody, and that the special resonance effect brought about by the simultaneous glottal constriction is an exponent of the w-element. We may thus interpret the glottalization of **ɓ** and **đ** as serving both to ensure the tense phonation and rapid onset to the following vowel that are characteristic exponents of δ as a phonematic unit, and to contribute to the dark resonance effect characteristic of w- prosody. Within such a framework, we do not expect to find further glottalized plosives, since there are no further combinations of tense phonation with dark resonance.

If we turn now to examine the phonetic phenomena to which attention is drawn in Problem 3, we discover that in both dialects there are initial consonants which never occur before labial semivowels; initial consonants which do so quite frequently; and initial consonants which do so less frequently, or very rarely.

(i) The initial consonants which never occur before a labial semivowel are:

NV	SV
ɓ, z (< 'r' or 'gi'), **m, f, v**	**ɓ, j** (< 'gi', **ɹ, f, (b)j**

(ii) Those which frequently occur in such a position are in order of frequency of occurrence:

NV	SV
k x h t ŋ s(< 'x') **th l**	**k h x l ŋ t th s(j)**

(iii) Those which occur less frequently or very rarely are:

NV	SV
ɲ, ch (< 'ch'), **đ, ch**(< 'tr'), **s**(< 's')**z**(< 'd'), **n, ɣ**	**đ, j**(< 'd'), **c, ɲ, ʃ, t, n, m, ɣ**

It will be noted from the above that in neither dialect are labial or labio-dental consonants found before **w**, with the exception of **m** in SV. The two instances of labialized **m** recorded for SV occur in the words

'moa' and 'moå', both first person pronominal forms borrowed quite recently, along with 'toa', from the French 'moi' and 'toi'. Our polysystemic working hypothesis allows us to relegate such partially assimilated loans, which might otherwise distort our picture of the phonology of the language, to special secondary phonological systems.[48] These two words being excluded, it is possible to make the generalized phonetic statement that labially articulated initial consonants are never followed by a labial semivowel. If we seek to make phonological sense of this, we see that we are here dealing with syllables whose onset is characterized by dark resonance, or w- prosody, and may assume that what is dark already does not require to be made any darker. We should therefore not expect any further labial component to be added to the initial complex of such syllables.

Before we go on to examine the non-labial consonants which are never found before **w**, it must be pointed out that although in NV no distinction in pronunciation is made between 'ch-' and 'tr-' (both **ch**), between 's' and 'x' (both **s**), or between 'd-', 'r-' and 'gi-' (all **z**, except in adagio literary style, when 'r' may be pronounced **ɹ**), my NV informants nevertheless kept these apart orthographically with fairly rare cases of uncertainty. The difference in the distribution of **s** < 's' and **s** < 'x', and of **z** < 'r' or 'gi' and **z** < 'd', before **w** or **ɥ** seems to justify separating these consonants for the purposes of phonological analysis.[49]

Of the non-labial consonants which do not occur before a labial semivowel, and which may therefore tentatively be expected to include exponents of w- prosody, i.e. NV **z** < 'r' and 'gi', SV **j** < 'gi'', **ɹ**, and **tɹ**, the interpretation of SV **tɹ** and **ɹ** as cumulative exponents of $^{yw}\psi$ and $^{yw}\rho$ respectively presents no difficulty, and it seems not unreasonable, in view of its absence before **w** and the occasional variant pronunciation **ɹ**, to interpret NV **z** < 'r' as $^{yw}\rho$ for the Northern dialect. It remains to consider NV **z**, SV **j** < 'gi'. Despite the convergence of exponents in SV with $^{y}\rho$, there is phonetic support for the alignment of the sound with σ in the strongly fricative pronunciation observed in adagio speech. The association with w- prosody is harder to defend. The non-occurrence of 'gi-' in labialized syllables leads us to expect that it should be possible to abstract from NV **z** and SV **j** phonetic features referable to dark or mixed syllable onset. The pronunciation of these sounds, however, does not accord well with the phonetic exponents stated above for either of these prosodies and no more accommodating re-statement of the exponents has so far suggested itself. The alignment of the sounds

with $^{w}\sigma$ in Table C is therefore no more than tentative gap-filling, pending some more plausible hypothesis.

If we postulate that the phonological presence of dark syllable onset precludes the occurrence at the phonetic level of a labial semivowel after the initial consonant, we might expect that the initial consonant of syllables in which there is a labial semivowel will be such as would in other contexts be associated with clear or neutral syllable onset. A comparison of Table C with the consonants listed under (ii) on p. 180 confirms that this is in the main the case. We have, however, to deal with a number of consonants associated with yw- syllable onset prosody which occur, albeit infrequently or rarely, before a labial semivowel. The number of attested examples of **đ**, **n**, SV. **ʃ** and **tɹ**, before **w** is such that it cannot be held that the dark component of yw- onset prosody precludes absolutely the addition of a further dark element, as does w- onset prosody itself. We may, however, maintain that it tends to do so, as compared with y- and ə- onset prosodies.

The alignment of **ɣ** with $^{w}\rho$ accords reasonably well both with the pronunciation and distribution but for one puzzling exception, namely, the word 'góa' *widow, widowed.*[50] This word is of fairly common occurrence, not a recent loan, and not one which can be regarded as belonging to a special class of onomatopoeic, ideophonic or exclamatory forms. It cannot, therefore, on the evidence at present available, be handled as belonging to some secondary phonological pattern for which a different statement is required. Apart from this one word, **ɣ** groups with the labial consonants and with 'r' and 'gi-', and appears a likely candidate for what would otherwise remain a gap in Table C.[51]

Missing from Table C are the NV consonants **ch** < 'ch' and **v**, SV **c** and **(b)j**. These are tentatively put forward as front-modified initial complexes comparable in some ways with the labialized initial complexes already discussed, but differing from them in that they are far fewer in number and that there is no restriction as to the vowels they may precede. There are thus modified and unmodified initial complexes, and this presence or absence of initial modification may be taken as a syllable property and stated in terms of two separate prosodic systems of two terms each, with their focal point in the initial complex. The terms of the first of these systems of syllable onset modification are *dark modification*, symbolized by a superior ^{w} after the pre-nuclear phonematic unit, and *absence of dark modification*, left unmarked. The terms of the second system are *clear modification*, symbolized by a superior ^{y} after the pre-nuclear phonematic unit, and *absence of clear modification*, left

unmarked. Using the abbreviation Pr for pre-nuclear phonematic unit, we may make the following generalized statements:

Pr^{w}	precludes	Pr^{y}
^{w}Pr	precludes	Pr^{w}
^{yw}Pr	tends to preclude	Pr^{w}

Arguing from the above, we shall assume that ^{y}Pr precludes Pr^{y}, and that ^{yw}Pr tends to preclude Pr^{y}. NV **ch** < 'ch' and **v**, SV **c** and **(b)j** are interpreted as the cumulative phonetic exponents in the two dialects of $^{ə}Pr^{y}$ and $^{w}Pr^{y}$ respectively, and the initials **ch** and **c** before a labial semivowel, as in finals A 67, 141, 143 and B 66–67, 74, 141, 143, as those of $^{yw}Pr^{y}$.

To the unmodified initial complexes in Table C we may now add, in Table D below, the modified initial complexes interpreted as combinations of clear or dark modification prosodies in association with pre-nuclear phonematic units and syllable onset prosodies:

TABLE D

Syllable onset prosodies	*Syllable onset modification*					
	System 1					*System 2*
	Pr^{w}					Pr^{y}
	δ	ψ	μ	σ	ρ	
w	—	—	—	—	—*	NV **v**, SV **(b)j**
y	**tw**	**thw**	**ɲw**	**sw**	SV **jw** < 'd' NV **zw** < 'd'	—
ə	**kw**	NV **xw** SV **x(w)**	**ŋw**	NV **hw** SV **ʔw**	**lw**	NV **ch** < 'ch' SV **c**
yw	**đw**	SV **tɹw** NV **chw** < 'tr'	**nw**	SV **ʃw** NV **sw** < 's'	—	NV **chw** < 'ch' SV **cw**

* With the one exception discussed on p. 182.

The above at once raises a new question. Why are there five values stateable for Pr^{w} and only one for Pr^{y}? A hint of an answer in historical terms, assuming the gradual convergence of the exponents of ^{w}Pr, ^{ə}Pr and ^{yw}Pr in association with clear modification, is perhaps to be seen in the tendency in modern SV for the labial semivowel to be pronounced very lightly and frequently to be dropped altogether so that we must either suppose that the exponents of $^{ə}\psi^{w}$, for example, converge with those of $^{ə}\psi$ or, alternatively, that $^{ə}\psi^{w}$ does not occur. Note also that for $^{ə}\sigma^{w}$ where NV still has **hw**, SV pronounces **ʔw**, which may be regarded as a step towards the more generalized $^{ə}Pr^{w}$.

Our discussions in this section so far have dealt almost exclusively with three-place structures, for the first place of which a system of

pre-nuclear phonematic units is stateable. Syllables without an initial consonantal articulation, or with a weak initial glottal stop, are regarded as having a two-place structure. Two-place structures have no pre-nuclear phonematic units. A system of nuclear phonematic units is stated for the first place, and a system of post-nuclear phonematic units for the second place. The system of syllable-onset prosodies stateable for such structures is one of three terms only and is co-terminous with the nuclear resonance system.[52] It is for this reason that Vietnamese syllable structure cannot conveniently be stated in terms of a three-place structure only, with zero consonant as the sixth term in the system of pre-nuclear phonematic units, since the relation of such a sixth phonematic unit with the syllable onset prosodies and the nuclear prosodies would be gravely at variance with those of the other five. Anticipating the phonological description of the nucleus for a moment,[53] this may be expressed as follows:

^{w}Pr presupposes ^{w}Nu, ^{y}Nu or ^{ə}Nu; Pr^{w} precludes ^{w}Nu.

Now the possible phonetic exponents that might be stated for ^{w} zero are *either* an initial labial semivowel, *or* an initial back rounded vowel. But if ^{w}zero = w-, it will be found to preclude ^{w}Nu, and if ^{w}zero = an initial back rounded vowel, it will be found to preclude ^{ə}Nu and ^{y}Nu. Either way, the interior syntagmatic relations of syllable structures containing zero in first place would be quite different from those of syllables containing one of the five pre-nuclear units postulated earlier. In short, the structures of such syllables are different. It has been decided to handle the difference in this paper by describing one set of structures as having three places and the other as having two.

Problems 5–11. It is convenient to look at problems involving vocalic and final consonontal elements together, since there is considerable interplay between the two, especially in SV.

We shall propose a nuclear phonematic system of two terms for the second place in three-place structures, and for the first in two-place structures, and a post-nuclear phonematic system of three terms for place three in three-place structures and place two in two-place structures. To handle syllable resonance qualities we shall require to postulate two prosodic systems, one with its focal point in the syllable nucleus and the other with its focal point in the syllable ending. In the phonological notation of post-nuclear phonematic units, letters already used for the pre-nuclear phonematic units will be avoided in order to emphasize the

fact that, despite any phonetic similarity we may detect between the consonant sounds at the beginning and at the end of syllables, no special phonological relations obtain between the pre-nuclear and post-nuclear phonematic systems, other than that both are marginal as opposed to nuclear. With the prosodies it is otherwise, since there are in given cases syntagmatic relations to be stated between syllable onset prosodies and onset modification prosodies, between onset modification prosodies and nuclear prosodies, between both syllable onset prosodies and onset modification and syllable terminating prosodies, and between nuclear prosodies and either one or both of the marginal prosodic systems.[54] We shall thus find it convenient to use the same symbols and some of the same labels as were used in the statement of syllable onset prosodies.

The nuclear phonematic system is as follows:

Terms	*Phonetic Exponents*
ι	Relatively close tongue position.
α	Relatively open tongue position.

The post-nuclear phonematic system is as follows:

Terms	*Phonetic Exponents*
τ	Complete closure of both oral and nasal passages, with abrupt cutting off of airstream.
ν	Closure at some point in the mouth with lowered soft palate, allowing the passage of voiced air through the nose.
ζ	Absence of closure in the mouth, allowing passage of voiced air without audible friction.

The two prosodic systems stateable as having their focal point in the syllable nucleus are as follows:

Nuclear Resonance System

Terms		*Phonetic Exponents*
Dark	(w)	Back of tongue raised, lips rounded.
Clear	(y)	Front of tongue raised, lips unrounded.
Neutral	(ə)	Retracted tongue position, i.e. centre or back of tongue raised, lips unrounded.

Nuclear Extension System

Terms	*Phonetic Exponents*
Central extension (a)	*Either* more open tongue position than when extension is absent, with or without centralized vocalic off-glide, *or* prolongation of vowel with or without centralized off-glide.
Absence of central extension (unmarked)	Absence of prolongation of vowel or of centralized off-glide, with or without closer tongue position than when extension is present.

The syllable-terminating prosodic system is as follows:

Terms		*Phonetic Exponents*
Dark	(w)	Bilabial articulation.
Clear	(y)	Lips spread or neutral, with *either* tip or blade of tongue brought into contact with the denti-alveolar region, *or* dorsum raised towards the hard palate or velum.
Neutral	(ə)	Lips spread or neutral with dorsum either raised towards the soft palate or in neutral position, i.e. rather low in the mouth, not raised to any marked degree towards the hard palate.

Table E below lists the phonematic structures for the penultimate and ultimate places in Vietnamese syllables together with the prosodies having their focal point in the syllable nucleus and ending, and a phonetic transcription of the pronunciations with which they are associated in the two dialects. The statement assumes the same phonological structure for both NV and SV, and handles the differences between them as differences of phonetic exponency only.[55] Where convergence of phonetic exponents is postulated, square brackets enclose the second entry in the table of the relevant phonetic sequence. Where divergence is postulated, the second pronunciation shown is enclosed in round brackets. Pure vowels and diphthongs in apparently free variation (as SV **e** and **ei**) or phonetically determined variation (as NV **ɛ** and **ɛə**) are separated by a comma. In the phonological formulae, the symbols for the prosodies of the nuclear resonance system are placed to the left of the nuclear phonematic symbol, symbols for the prosodies of the nuclear extension system to the right of it. The symbols for syllable

TABLE E

	NV	SV		NV	SV		NV	SV
$_{\gamma\iota\zeta\gamma}$	i	i, ɪi	$_{\partial\iota\zeta\gamma}$	əi	ii	$_{w\iota\zeta\gamma}$	ui	ui
$_{\gamma\iota\zeta\partial}$	iə	iə	$_{\partial\iota\zeta\partial}$	ɤ	ɤ, ʌɤ	$_{w\iota\zeta\partial}$	uə	uə
$_{\gamma\iota\zeta w}$	iu	iu	$_{\partial\iota\zeta w}$	əu	au	$_{w\iota\zeta w}$	u	u, ʊu
$_{\gamma\iota\tau\gamma}$	it	it	$_{\partial\iota\tau\gamma}$	ət, (ɯt)	ɯk	$_{w\iota\tau\gamma}$	ut	uk
$_{\gamma\iota\tau\partial}$	ïiḳ	ət	$_{\partial\iota\tau\partial}$	ək	ʌk	$_{w\iota\tau\partial}$	uk͡p̄	ok
$_{\gamma\iota\tau w}$	ip	ip	$_{\partial\iota\tau w}$	əp	ɯp, (ɤp)	$_{w\iota\tau w}$	up	up
$_{\gamma\iota\nu\gamma}$	in	in	$_{\partial\iota\nu\gamma}$	ən	ɯŋ	$_{w\ddot{\imath}\nu\gamma}$	un	uŋ
$_{\gamma\iota\nu\partial}$	ïiŋ	ən	$_{\partial\iota\nu\partial}$	əŋ, (ɯŋ)	ʌŋ	$_{w\iota\nu\partial}$	uŋ͡m̄	oŋ
$_{\gamma\iota\nu w}$	im	im	$_{\partial\iota\nu w}$	əm	ɯəm, (ɤm)	$_{w\iota\nu w}$	um	um
$_{\gamma\iota^a\zeta\gamma}$	[i]	[i, ii]	$_{\partial\iota^a\zeta\gamma}$	ɯəi, (ɤi, ɯi)	ɯi, (ɤi)	$_{w\iota^a\zeta\gamma}$	uəi	[ui]
$_{\gamma\iota^a\zeta\partial}$	[iə]	[iə]	$_{\partial\iota^a\zeta\partial}$	ɯə	ɯə	$_{w\ddot{\imath}^a\zeta\partial}$	[uə]	[uə]
$_{\gamma\iota^a\zeta w}$	iəu	[iu]	$_{\partial\iota^a\zeta w}$	ɯəu, (ɯu)	ɯu	$_{w\iota^a\zeta w}$	[u]	[u]
$_{\gamma\iota^a\tau\gamma}$	iət	iək	$_{\partial\iota^a\tau\gamma}$	ɯət, (ɤt)	ɯək	$_{w\iota^a\tau\gamma}$	uət	uək
$_{\gamma\iota^a\tau\partial}$	iək	[iək]	$_{\partial\iota^a\tau\partial}$	ɯək	[ɯək]	$_{w\iota^a\tau\partial}$	uək	[uək]
$_{\gamma\iota^a\tau w}$	iəp	[ip]	$_{\partial\iota^a\tau w}$	ɯəp, (ɤp)	[ɯp, (ɤp)	$_{w\iota^a\tau w}$	[up]	[up]
$_{\gamma\iota^a\nu\gamma}$	iən	iəŋ	$_{\partial\iota^a\nu\gamma}$	ɯən, (ɤn)	ɯəŋ	$_{w\iota^a\nu\gamma}$	uən	uəŋ
$_{\gamma\iota^a\nu\partial}$	iəŋ	[iəŋ]	$_{\partial\iota^a\nu\partial}$	ɯəŋ	[ɯəŋ]	$_{w\iota^a\nu\partial}$	uəŋ	[uəŋ]
$_{\gamma\iota^a\nu w}$	iəm	[im]	$_{\partial\iota^a\nu w}$	ɯəm, (ɤm)	[ɯəm, (ɤm)]	$_{w\iota^a\nu w}$	uəm	[um]
$_{\gamma\alpha\zeta\gamma}$	e	e, ei	$_{\partial\alpha\zeta\gamma}$	ai	a:i	$_{w\alpha\zeta\gamma}$	oi	oi
$_{\gamma\alpha\zeta\partial}$	ɛ, ɛə	ɛ	$_{\partial\alpha\zeta\partial}$	a	a	$_{w\alpha\zeta\partial}$	ɔ, ɔə	ə
$_{\gamma\alpha\zeta w}$	eu	eu	$_{\partial\alpha\zeta w}$	au	a:u	$_{w\alpha\zeta w}$	o	o, ou
$_{\gamma\alpha\tau\gamma}$	et	[ət]	$_{\partial\alpha\tau\gamma}$	at	ak	$_{w\alpha\tau\gamma}$	ot	[ok]
$_{\gamma\alpha\tau\partial}$	ëiḳ	ɐt	$_{\partial\alpha\tau\partial}$	ak	ɤk	$_{w\alpha\tau\partial}$	auk͡p̄	ək
$_{\gamma\alpha\tau w}$	ep	ep	$_{\partial\alpha\tau w}$	ap	ap	$_{w\alpha\tau w}$	op	op
$_{\gamma\alpha\nu\gamma}$	en	[ən]	$_{\partial\alpha\nu\gamma}$	an	aŋ	$_{w\alpha\nu\gamma}$	on	[oŋ]
$_{\gamma\alpha\nu\partial}$	ëiŋ	ɐn	$_{\partial\alpha\nu\partial}$	aŋ	ɤŋ	$_{w\alpha\nu\partial}$	əuŋ͡m̄	əŋ
$_{\gamma\alpha\nu w}$	em	em	$_{\partial\alpha\nu w}$	am	am	$_{w\alpha\nu w}$	om	om
$_{\gamma\alpha^a\zeta\gamma}$	[e]	[e, ei]	$_{\partial\alpha^a\zeta\gamma}$	a:i	[a:i]	$_{w\alpha^a\zeta\gamma}$	ɔi	ɔi
$_{\gamma\alpha^a\zeta\partial}$	[ɛ, ɛə]	[ɛ]	$_{\partial\alpha^a\zeta\partial}$	a	a	$_{w\alpha^a\zeta\partial}$	[ɔ, ɔə]	[ə]
$_{\gamma\alpha^a\zeta w}$	ɛu	ɛu	$_{\partial\alpha^a\zeta w}$	a:u	[a:u]	$_{w\alpha^a\zeta w}$	[o]	[o, ou]
$_{\gamma\alpha^a\tau\gamma}$	ɛt	ɛək	$_{\partial\alpha^a\tau\gamma}$	a:t	a:k	$_{w\alpha^a\tau\gamma}$	ɔt	auk͡p̄
$_{\gamma\alpha^a\tau\partial}$	ëiḳ, (ɛk)	[ɛək]	$_{\partial\alpha^a\tau\partial}$	a:k	[a:k]	$_{w\alpha^a\tau\partial}$	auk͡p̄	[auk͡p̄]
$_{\gamma\alpha^a\tau w}$	ɛp	ɛp	$_{\partial\alpha^a\tau w}$	a:p	a:p	$_{w\alpha^a\tau w}$	ɔp	ɔp
$_{\gamma\alpha^a\nu\gamma}$	ɛn	ɛəŋ	$_{\partial\alpha^a\nu\gamma}$	a:n	a:ŋ	$_{w\alpha^a\nu\gamma}$	ɔn	auŋ͡m̄, (əŋ͡m̄)
$_{\gamma\alpha^a\nu\partial}$	ëiŋ, (ɛŋ)	[ɛəŋ]	$_{\partial\alpha^a\nu\partial}$	a:ŋ	[a:ŋ]	$_{w\alpha^a\nu\partial}$	auŋ͡m̄,(ɔŋ)	[auŋ͡m̄,(əm̄ŋ)]
$_{\gamma\alpha^a\nu w}$	ɛm	ɛm	$_{\partial\alpha^a\nu w}$	a:m	a:m	$_{w\alpha^a\nu w}$	ɔm	ɔm

terminating prosodies are placed after the symbol for the post-nuclear phonematic unit.

The above statement goes a long way towards solving Problems 5, 6,

and 7. The system proposed does not require that there should be vowels identifiable with 'ă' and 'â' in phonetically open syllables. The only probable 'gaps' that such vowels, if they existed, might conceivably fill are $^{\circ}\iota\zeta^{\circ}$ and $^{\circ}\alpha\zeta^{\circ}$, which are satisfactorily filled already. The variations in vowel length and diphthongization mentioned in Problem 6 no longer appear haphazard. By and large, shortness or length of vowel occurs where one would expect, and the diphthongization of NV **ɛə** and **ɔə** and of SV **ɨi, ei, ou, ʊu** are not only explicable in terms of phonetic exponents but are even predictable. The apparent gaps in the diphthongs referred to in Problem 7 (i) are seen not to be gaps at all in our system. All diphthongs are exponents of Nuζ structures. Where both nuclear and terminating prosody are of the same type, i.e. both dark, both clear, or both neutral, the cumulative exponents of the nuclear prosody and nuclear phonematic unit may extend through to the end of the syllable without perceptible change. This is commonly the case in NV. In SV there is frequently a slight raising of the tongue towards the end of the syllable so that a narrow closing diphthong is heard. Problem 7 (ii) is one no longer in the light of Table E, since the occurrences mentioned are perfectly systematic and in keeping with those dealt with under 7(i). Problem 7(iii) is more difficult, and I here suggest recourse to the concept of divergence. The recorded instances of 'ʊu' in NV are few in number (23 out of a theoretical maximum of 144), those of 'ʊʊu' even fewer (8 out of 144), and there is one solitary example of 'ʊu' in the word 'nʊ́u' *gum*. If the attested syllables containing these finals are examined as wholes, taking into account the initial consonants and the tone as well as the final, it is found that the only overlapping forms recorded are 'hɯʊu' and 'hɯu'. It is suggested that **ɯəu, ɯu** and **ʏu** are to be regarded as divergent sets of phonetic exponents of $^{\circ}\iota^{a}\zeta^{w}$ in NV, and that the conditions under which one form or another is to be expected, which are still to be investigated, will probably turn out to be partly phonetic, i.e. linked with the initial consonant or initial modification or with the tone, and partly a matter of primary and secondary patterns, i.e. there may be a difference in behaviour in this respect between indigenous words of the primary pattern[56] and borrowed words of Chinese origin for which a secondary pattern requires to be stated. From a preliminary check with dictionaries it seems probable that 'hɯu' and 'nʊ́u' should be assigned to secondary patterns. It is of interest here that there is convergence of 'ʊʊu' and 'ʊu' in SV.[57] My SV informant did not know the form 'nʊ́u' although he believed that he might have heard it. Similar arguments to those used above can be brought to support the

grouping together of **ɯəi, ʏi** and **ɯi** as divergent phonetic exponents of $^{\circ}\iota^{a}\zeta^{y}$. It is noteworthy in this case that of the four recorded instances of **ɯi**, one was recorded by my informant as being in free variation with **ɯəi**, and a second as being in free variation with **ʏi**.

Problem 8. (i) Table E enables us to make the generalized statement that where Nu = ι, there is in SV convergence everywhere of NuPo^{w} and Nu^{a}Po^{w}, and, except when Po = ζ, convergence of Nu^{a}Po$^{\circ}$ and Nu^{a}Po^{y}. The final retracted apical contact of SV **it, in, ət, ən, ɐt** and **ɐn** arises from the combination of exponents of ^{y}Nu with those of Po$^{\circ}$ and Po^{y} when there is no intervening extension prosody.[58] The velar contact of **ɯk, ʌk, ɯŋ, ʌŋ, ak, aŋ, a:k, a:ŋ, uk, ok, ɔk**, etc. arises from the combination of exponents of $^{\circ}$Nu and ^{w}Nu and of any nucleus with an extension prosody with those of Po$^{\circ}$ and Po^{y}. There is in general no convergence in syllables characterized by absence of nuclear extension, i.e. the exponents of $^{\circ}$Nu Po^{y} and $^{\circ}$Nu Po$^{\circ}$, and of ^{w}Nu Po^{y} and ^{w}Nu Po$^{\circ}$ do not converge, but variation in usage among SV speakers as regards the finals spelt 'ich', 'êch' and 'ach' supports the suggestion made in Table E that there may be convergence of $^{y}\iota\tau^{\circ}$ and $^{y}\alpha\tau^{y}$, i.e. the closeness of **i** in **it, in**, as opposed to **ə** is a cumulative exponent of ι as opposed to α and of Po^{y} as opposed to Po$^{\circ}$. Similarly, **ə** is variously an exponent both of α as opposed to ι and of Po^{y} as opposed to Po$^{\circ}$ in Po^{y} syllables, and of Po$^{\circ}$ as opposed to Po^{y} in $^{y}\iota$ syllables. We may generalize further by saying that in syllables without nuclear extension extra openness of vowel is everywhere an exponent of Po$^{\circ}$ as contrasted with Po^{y}, with convergence of $^{y}\iota$Po$^{\circ}$ and $^{y}\alpha$Po^{y} and of $^{w}\iota$Po$^{\circ}$ and $^{w}\alpha$Po^{y} except where Po = ζ, viz.:

$^{y}\iota\tau^{y}$	$^{y}\iota\nu^{y}$	$^{\circ}\iota\tau^{y}$	$^{\circ}\iota\nu^{y}$	$^{w}\iota\tau^{y}$	$^{w}\iota\nu^{y}$
it	**in**	**ɯk**	**ɯŋ**	**uk**	**uŋ**
$^{y}\iota\tau^{\circ}$	$^{y}\iota\nu^{\circ}$	$^{\circ}\iota\tau^{\circ}$	$^{\circ}\iota\nu^{\circ}$	$^{w}\iota\tau^{\circ}$	$^{w}\iota\nu^{\circ}$
ət	**ən**	**ʌk**	**ʌŋ**	**ok**	**oŋ**
$^{y}\alpha\tau^{y}$	$^{y}\alpha\nu^{y}$	$^{\circ}\alpha\tau^{y}$	$^{\circ}\alpha\nu^{y}$	$^{w}\alpha\tau^{y}$	$^{w}\alpha\nu^{y}$
ət	**ən**	**ak**	**aŋ**	**ok**	**oŋ**
$^{y}\alpha\tau^{\circ}$	$^{y}\alpha\nu^{\circ}$	$^{\circ}\alpha\tau^{\circ}$	$^{\circ}\alpha\nu^{\circ}$	$^{w}\alpha\tau^{\circ}$	$^{w}\alpha\nu^{\circ}$
ɐt	**ɐn**	**ʏk**	**ʏŋ**	**ɔk**	**ɔŋ**

(ii) The centrality of **ə** and **ɐ** in Po$^{\circ}$ structures may be accounted an exponent of Po$^{\circ}$, but the centrality of **i** and **ə** in Po^{y} structures remains puzzling.

Problem 9. NV ïiķ, ëiķ, ëiķ, ïiŋ, ëiŋ, ëiŋ are interpreted as cumulations of discontinuous exponents of ʸNu Poᵊ and ᵊNu Poᵊ structures in the primary phonetic pattern in which the realization of the nuclear and syllable-terminating prosodies extends over the whole of the final complex. Thus, the centralization of the vowel and the final velar articulation are exponents of neutral syllable termination, while the palatal on-glide to the final consonant and the fronted articulation of that consonant are exponents of clear nuclear resonance. The very few words with final **ɛk** and **ɛŋ** are mostly onomatopes or loans or bound forms[59] and are as such regarded as demonstrating a secondary phonological pattern of which, as contrasted with the primary pattern discussed above, the phonetic exponents are discrete.[60]

Problem 10. A similarity of pattern between the finals under consideration here and those discussed under Problem 9 may be discerned. We are dealing with the cumulative exponents in NV of ʷαPoᵊ and ʷαᵃPoᵊ, and in SV of ʷαᵃ Poᵊ, in which the unrounded and central quality of the vowel and final velar articulation are exponents of neutral syllable termination and the rounded back on-glide and final labial closure are exponents of dark nuclear resonance. The final 'oong', which is only found in a few words of fairly recent French borrowing,[61] follows a secondary pattern appropriate to unassimilated loans. It is of interest here that SV **ɔŋ** < 'on' is kept distinct in pronunciation from **ɔŋm͡** < 'oong'.[62]

Problem 11. Since Prʷ precludes ʷNu, it presupposes ʸNu or ᵊNu. We shall expect, therefore, to find phonetic sequences of labial semivowel and vowel which can be associated with ʸι, ʸα, ᵊι, and ᵊα in Poʷ structures. This is indeed what we find, syllables with final 'uy', 'uych', etc., being associated with ʷʸι, 'uya', 'uyên, 'uyêt' finals with ʷʸιᵃ, 'uê' finals with ʷʸα, 'oe' finals with ʷʸαᵃ, 'oă' finals with ʷᵊα, 'oa' finals with ʷᵊαᵃ, 'uâ' finals with ʷᵊι, and the final 'uơ' with ʷᵊιᵃ. The limitation of initial consonants before the final 'ɯ' which is referred to in Problem 14 (i) falls into place when we observe that, with the exception of three words in each dialect,[63] no consonants associated with dark syllable onset occur before **ɯ** in open syllables. This suggests the interpretation of **ɯ** in open syllables as a cumulation of the phonetic exponents of ʷᵊιζᵊ, leaving the problem of the three exceptions in each dialect for further investigation.

Problem 12. Examination of the phonic data shows that syllables containing a labial semivowel are rarely closed by a labial consonant or by

a diphthong ending in a rounded vowel. Furthermore, of the recorded instances, many upon closer investigation turn out to be words which might appropriately be excluded from the primary system such as onomatopes, ideophones, recent loans and the like. There remain, however, a number of forms which cannot, on the face of it, be so excluded. We cannot therefore say that in the primary system Prʷ precludes Poʷ absolutely, but only that it tends to do so. It might perhaps be expected to follow from this that Prʷ would presuppose Poᵊ and Poʸ without restriction, but the phonic data for NV[64] suggest otherwise. We find that **wa:** and **wa** appear to occur freely before both **-n** and **-ŋ**, **-t** and **-k**, and before **-i**, but that with very few exceptions other than forms which are clearly assignable to a secondary system, or which are bound forms found in compounds only,[65] **ɥə** and **ɥiə** occur only before final **-n**, and **-t** and **-i**, and **wɛ** and **ɥi** only before final **-ŋ** and **-k**. **ɥe** is very rare in any context, but what examples there are in closed syllables occur before **-k** and **ŋ** and are without exception potential secondary structures. In phonological terms, we find a preference in the primary system for ʷʸιPoᵊ as against ʷʸιPoʸ, ʷʸαᵃPoᵊ as against ʷʸαᵃPoʸ, ʷʸιᵃPoʸ as against ʷʸιᵃPoᵊ, and for ʷᵊιPoʸ as against ʷᵊιPoᵊ. There appears to be no preference as between ʷᵊαPoʸ and ʷᵊαPoᵊ, or as between ʷᵊαᵃPoʸ and ʷᵊαᵃPoᵊ. From the above we may conclude that there is a tendency in Prʷ syllables for ʸNu to preclude Poʸ and for ᵊNu to preclude Poᵊ, except where ᵊNu = ᵊα. We may make the further generalization that there is a tendency in the primary system as a whole to avoid Prʷ structures having two dark, two clear or two neutral prosodies focused upon the part of the syllable following the initial consonant, i.e. there is a tendency to avoid such structures as Prʷ Nu Poʷ, Prʷʸ Nu Poʸ or Prʷᵊ Nu Poᵊ. This hypothesis fails, however, to account for the preference for ʷʸιᵃ Poʸ ('-uyêt', '-uyên), as against ʷʸιᵃ Poᵊ. If it is extended to apply in some measure to prosodies focused upon the initial consonant itself, it does, however, go some way towards accounting for the phenomena mentioned in Problem 14 (iv), and also, in Problem 14(v), for the velar articulation of the consonant occurring before **ɥe**, **ɥiə** and **ɥiu** but not for the fact that it is a fricative rather than a plosive.

Some of the questions raised under Problems 13 and 14 have already been touched upon in the preceding pages and tentative answers to some of them given. The patchy distribution of closed syllables containing the vowels written 'ɯ' and 'ơ' and of the diphthongs and triphthongs written 'ɯi', 'ơi', 'ɯu', 'ơu', 'ɯơu' and 'ɯơi', together with the

number of recorded instances of variation between such finals as 'ɯn' ~ 'ân', 'ɯi' ~ 'ơi', 'ɯng' ~ 'âng', 'ɯt' ~ 'ât', 'ɯơi' ~ 'ơi', 'ơn' ~ 'ân', etc., has prompted the suggestion that in Problem 13 (i) and (ii) we are probably concerned with divergence of phonetic exponents of structural elements, arising in part from the intermingling with the primary phonological system of secondary systems which we are at present unable to sift out. No solution to Problem 13 (iii) has so far suggested itself. A solution to Problem 14 (i) has already been put forward, in the course of the discussion of Problem 11. Problem 14 (ii), (iii) (iv) and (v) remain baffling, despite the faint light shed on the latter two in the discussion of Problem 12. Further study jointly with Problems 4 and 16 is required before a solution can be expected.

Summary

The elements of syllable structure here proposed[66] and the syntagmatic relations within the syllable that have a bearing on the problems under review are summarized briefly below. The symbol π is used to designate the prosodic systems, which are identified by number as follows: π_1 = syllable onset; π_2 = onset modification; π_3 = nuclear; π_4 = nuclear extension; π_5 = syllable termination.

Syllable structure = $^{\pi_1}$Pr $^{\pi_2\pi_3}$Nu$^{\pi_4}$Po$^{\pi_5}$ or $^{\pi_2\pi_3}$Nu$^{\pi_4}$Po$^{\pi_5}$.

Pr = δ, ψ, μ, σ *or* ρ.
Nu = ι or α.
Po = τ, ν or ζ.
π_1 = w, y, ə or yw.
π_2 = π_{2a} or $\pi_{2b}.\pi_{2a}$ = w or non-w; π_{2b} = y or non-y.
π_3 = w, y or ə.
π_4 = a or non-a.
π_5 = w, y or ə.
π_1 = w precludes π_2 = w, and tends to preclude π_5 = w.
π_2 = w precludes π_3 = w, and tends to preclude π_5 = w.
π_1 = yw tends to preclude π_2 = y or w.
π_1 = y precludes π_2 = y, but π_2 = y does not preclude π_3 = y.
When π_2 = w, π_3 = y tends to preclude π_5 = y.
When π_2 = w, π_3 = w tends to preclude π_5 = w.
When π_2 = w, π_3 = ə tends to preclude π_5 = ə, except where Nu = α.

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Notes

[1] Firth (2), p. 123.

[2] Cp. Day, pp. 3–4; Thompson, pp. 455, 473–474.

[3] Scott, p. 556.

[4] See Allen, p. 945.

[5] It would clearly be necessary not only to check the syllable count thoroughly with many more speakers of both dialects but to match it against comparable material from the central dialect, and from as many others as possible. In order to disentangle the primary and secondary phonological patterns which are believed to lie behind much of the apparent divergence of phonetic exponents postulated here (see pp. 178, 188), it would be essential to find some means of tracking down all inter-dialectal borrowings and the odd spellings and artificial pronunciations to which they frequently give rise. It would, furthermore, be desirable to make structural comparisons with related languages, such as Mường, in which Chinese cultural influence has probably been less active, and with Chinese itself.

[6] As set forth in Robins (2), p. 3.

[7] Firth's adaptation of a passage in James B. Conant's *Science and Common Sense*. See Firth (5), p. 1.

[8] Since the material was collected some years ago, it is likely that it is by now old-fashioned in some respects, as regards both pronunciation and usage.

[9] But see note 28 on page 195.

[10] For a more detailed description of the articulation of Vietnamese 'ch' and 'nh', both initial and final, see Henderson (2).

[11] Cp. Emeneau, Preface, p. vii.

[12] Such Southern 'mis-spellings', for example, when borrowed into the Northern dialect have sometimes led to what may be regarded either as spelling pronunciations in NV or as alien pronunciations borrowed direct from SV. For example, the Southern mis-spelling 'Chệc' for 'Chệt', a slang word meaning 'Chinese', which is quite regularly pronounced with a final **-t** in SV (see p. 189), has given rise in NV to an aberrant pronunciation **-cek**, alongside the regular **-cet** < Chệt. (Cp. Lý, p. 66.) In a footnote on p. 6, Day quotes the Saigon edition of Lý, which I have not seen, as citing yet another orthographic variant of the same word, 'Trệc', which appears to add the further complication of a Northern mis-spelling, 'tr' for 'ch' (see p. 167).

[13] My Southern informant, with whom I worked after writing Henderson (1), may have contributed towards the clarification of the irregular Northern forms 'kéc' and 'kẻng' (see p. 174 and Henderson (1), p. 151) when he pointed out that his own regular spelling of the SV word corresponding to NV 'kẻng' was 'kẻn', and that he recognized a variant spelling 'két' for 'kéc'. He was also of the opinion that 'xẻng', for which a Chinese origin is suggested in Henderson (1) (p. 151), is Southern in origin.

[14] Missing are the figures for the finals 'ua', '-uôc/-uôt' and 'uôn/-uông', and for finals 20–27 inclusive, and final 104, with initials 20–24.

[15] Jones and Thong report (p. 64) that the spelling sequence 'ênh' 'does not occur in SV, being replaced by "inh" and pronounced accordingly'. They also imply (p. 68) that the sequence 'âc' does not occur. My informant produced, without prompting, examples of both spellings. As he confessed to considerable uncertainty as to the 'correct' final consonant letter in such cases, however, it is possible that some of his examples appear in the Jones and Thong material spelt with final '-t'.

[16] Cp. Emeneau, p. 12: 'Allophones are few, and the chief problem is the relation between initial and final consonants', and pp. 14–15.

[17] Cp. Thompson, p. 469; Emeneau, pp. 6–7, 14–15.

[18] Cp. Emeneau, pp. 12–13, 21; Lý, p. 104; Thompson, pp. 474–475; Jones and Thong, p. 66.

[19] Cp. Emeneau, p. 15; Day, p. 11; Lý, p. 22.

[20] My principal NV informant regularly pronounced ɛə and əə in syllables with the huyền, hỏi and ngã tones. For the differences in vowel length and diphthongization see Emeneau, pp. 5–6, 9–10; Thompson, pp. 461–464, 471–472, 475–476; Lý, pp. 39–40; Day, p. 11; Haudricourt (1).

[21] Cp. Day, pp. 9–10; Lý, p. 55; Emeneau, pp. 10, 12–13; Jones and Thong, p. 67; Thompson, pp. 467, 473.

[22] Cp. Thompson, pp. 462–464, 467–468; Jones and Thong, pp. 67–68; Hòa, as quoted by Day, in Day, fn. to p. 8.

[23] Cp. Emeneau, pp. 6–7, 9, 14–16; Day, pp. 6–9; Jones and Thong, pp. 63, 225–226; Haudricourt (1), pp. 91–93; Lý, p. 45.

[24] Cp. Emeneau, pp. 6, 8, 10, 13–14; Day, pp. 7–9; Haudricourt (1), pp. 92–93; Thompson, p. 460, 467–468, 473; Jones and Thong, pp. 2–3.

[25] Cp. Thompson, p. 466.

[26] Cp. Thompson, p. 466; Emeneau, p. 16.

[27] Cp. Day, pp. 7–8, fn. 6 on p. 5; Emeneau, pp. 16, 20–21; Jones and Thong, p. 68.

[28] Cp. Emeneau, pp. 12–13, 30. Emeneau notes an example of 'gi' before 'ê' in 'giền' ⟨**zen** *amaranth*.

[29] Haudricourt (2).

[30] Firth (2), p. 121.

[31] Firth (2), p. 137.

[32] Firth (1), p. 79. The phonetic transcription in Tables A and B represents an attempt, unsatisfactory in some respects, at dissection in general phonetic terms.

[33] See Firth (1), p. 80; Robins (1), p. 88. Cp. Halliday's 'points' or 'positions', Halliday, p. 193.

[34] Cp. Robins (2), p. 3.

[35] Firth (1), p. 80. Cp. also Firth (1), p. 86; Firth (2), pp. 127, 128, 133; Scott, pp. 556–557; Halliday, p. 193.

[36] See Allen, p. 943; Robins (1), p. 88.

[37] See Firth (4), p. vi.

[38] Firth (5), p. 31. Cp. also op. cit., p. 20.

[39] By 'Roman-based' is meant 'turned e' the symbol ə.

[40] Firth (5), p. 31.

[41] Cp. Firth (5), pp. 15, 25, 31.

[42] Numerical disparity is, however, of some concern in phonemic analysis, since

phonemicists usually feel required to decide whether, for instance, final [p] is to be regarded as an allophone of the same phoneme as initial [b̥], or whether final [t] is to be grouped with initial [t], [th] or [d̥]. See Emeneau, pp. 14–15; Thompson, pp. 458–460, 470.

43 The term 'dorsum' is used here to designate the upper surface of the tongue excluding the tip and blade; 'dorsal' articulations are those in which the articulating organ is the dorsum; 'apical' articulations are those in which the articulating organ is the tip or blade. Cp. Firth (3), p. 154.

44 It must not be assumed that these exponents are necessarily restricted to the initial consonant articulation. They may on occasion extend into the following vowel, and even beyond. For example, in SV 'vịt' [ˌbjiṭ] *duck*, both the fully front pronunciation of the vowel as contrasted with the centralized pronunciation in other contexts (see Table B) and the dental articulation of the final consonant, as attested by palatograms, are exponents of y-onset modification prosody. In SV 'tết' [ˈṭəṭ] *New Year*, palatograms show that both initial and final consonants are dental. The dental articulation of the final consonant must here be accounted an exponent of y-onset prosody, despite the intervening centralized vowel. That it is not an exponent of y nuclear resonance prosody is demonstrated by the fact that elsewhere final **-t** is post-alveolar after y resonance vowels.

45 See p. 166.

46 See p. 180.

47 Cp. Lý, pp. 40–41.

48 Cp. Firth (2), p. 136; Henderson (1), esp. pp. 152–153.

49 My colleague P. J. Honey tells me, however, that there is, in his experience, frequently uncertainty among Northern Vietnamese as to the spelling of words with 'x' or 's', 'ch' or 'tr', and 'r', 'gi' or 'd'.

50 Not recorded for the Vinh dialect by Emeneau, who lists **ɣ** among the consonants never found before **w** (p. 12).

51 At first sight initial **w-** might seem an even more likely candidate, but the non-occurrence of this sound before a following back rounded vowel is out of agreement with the relations of the other phonematic units and onset prosodies with nuclear elements. See p. 184. An alternative solution might be the transposition of **ɣ** and SV **ɹ**, NV **z** < 'r', in Table C, since yw- onset prosody does not preclude a following **w** absolutely. See p. 183.

52 See p. 185.

53 See pp. 185–187. In what follows, the abbreviation Pr is sometimes used for 'pre-nuclear phonematic unit', Nu for 'nuclear phonematic unit', and Po for 'post-nuclear phonematic unit'.

54 This is, of course, why they are regarded as prosodies and not as linear elements.

55 The statement offered here is only one of several, all within the same general phonological framework, that have been explored, each having its own merits and demerits. The choice of the one presented here was dictated by considerations that seem closely akin to the principle behind Thompson's procedure for dealing with asymmetry, namely, the assumption of 'the elimination of asymmetrical features from the phonemic inventory and the distributional table whenever possible, and their treatment on the level of phonetic description'. See Thompson, p. 474.

56 Shorto has proposed (fn. 2 on p. 545) in the interests of clarity that the term 'pattern', rather than 'system', should be used 'to denote the total manifold of

structures and systems'. I have tried to follow this useful suggestion as far as possible.

57 If divergence is accepted as a reasonable explanation of the differentiation between **ɯəu** and **ɯu** in NV, it is, strictly speaking, illogical to talk of convergence of these forms in SV. It might be preferable to assume divergence of spelling under the influence, perhaps, of NV.

58 See, however, n. 44 on p. 196.

59 Viz. 'kéc' *parrot* (see n. 13), 'cù léc' *tickle*, 'leng keng' *noise of a bell*, 'kèng' *smart* (slang, poss. < *Américain*. Day gives the meaning as *to be American*, see Day, p. 18); 'xèng' *shovel* (see n. 13). 'méc' *to relate, gossip*, which is in free variation with the regular form 'mách', is puzzling. Day and Emeneau also cite 'eng éc' to *squeal (like a pig)*, see Day, p. 18, Emeneau, p. 16. This form occurs in my SV but not my NV material.

60 For this reason these words are much easier than the primary forms to handle in phonemic terms.

61 Viz. 'boong' (< Fr. *pontin*) *bridge* (of a ship); 'loong-toong (< Fr. *planton*) *office-boy*, 'ba-toong' (< Fr. *bâton*) *stick*. Day (p. 7) and Haudricourt (p. 92) cite other similar forms.

62 My limited observation of Huê pointed to a similar distinction in that dialect between **uk** < 'ut' and **uk͡p** < 'uc'.

63 'bứ', 'giư', 'giữ' in NV; 'bư', 'bự', 'giữ' in SV.

64 The SV is less helpful here both because of the complementary distribution of final **-n** and **-ŋ**, and **-t** and **-k**, and because of the less stable occurrence of labialized initials.

65 The frequency with which rare or seemingly irregular sequences of sounds are marked in my material as occurring only in bound forms, and especially in reduplicated constructions, suggests that these may require to be interpreted as belonging to phonological systems other than that stateable for indigenous free forms.

66 The reader is reminded that the consideration of tone and of concomitant phonetic features such as voice quality is excluded from this study.