VOWEL LENGTH IN THAI

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1. Introduction

It has long been noted that, except for the vowel /a/, vowel length distinction carries very little functional load in Thai.[1] Minimal pairs are not as hard to find as most writers seem to indicate, but the tendency towards complementary distribution is unmistakable. The full picture of this complementation involves several different dimensions of environment and is difficult to show in a single chart, but if we proceed step by step it will soon become clear. The first step is to separate the vowels into classes that show different types of complementary distribution, and this can almost be done with the dimension of ancient tonal categories alone. These statistics are given in table 1.[2] Words ending with a vowel are not considered since, by definition, they cannot have a length distinction (see section 2); and words ending with a glottal stop are not considered since they never do have a length distinction.[3]

The four patterns that emerge can be seen by comparing the vowels at the four corners of Table 1 (/i a ε ua/). All others are either like one of these or in-between. Actually, the evidence is much neater than this, and a consideration of final consonants and modern tones would sharpen up the complementary distribution tendencies considerably. The figure given in the /ɔ/ -O cell, for example, is more than halved when the combination of rising tone and final semivowel is found to be a consistently vowel shortening environment in this pattern; and all but three of the words that remain can easily be explained by a vowel shortening reduplication pattern and English borrowings. Using this kind of additional information, we can sharpen up the patterns and represent them schematically as shown in Table 2. A plus sign is used to mean significantly more than in the other length, and a minus sign means significantly less. The equals, of course, mean no significant difference, and zero means practically non-existent or any occurrence has got to have a special explanation. The arrangement corresponds to that of the four corners of the statistical arrangement in Table 1.

	d	0	2	1	total
ii	42	11	0	0	53
i	49	57	33	39	178

	d	0	2	1	total
uu	41	19	0	0	60
u	73	67	33	49	222

	d	0	2	1	total
ee	30	31	4	0	65
e	40	34	9	20	103

	d	0	2	1	total
oo	43	61	9	19	132
o	81	75	15	24	195

	d	0	2	1	total
ʉʉ	22	14	8	14	58
ʉ	36	31	7	12	86

	d	0	2	1	total
aa	109	162	75	84	430
a	117	154	74	93	438

	d	0	2	1	total
εε	43	65	17	2	127
ε	3	11	7	37	58

	d	0	2	1	total
ɔɔ	65	104	33	7	209
ɔ	0	14	24	60	98

	d	0	2	1	total
əə	28	46	5	6	85
ə	3	1	1	4	9

	d	0	2	1	total
ia	37	74	22	34	167
	0	0	0	0	0

	d	0	2	1	total
ʉa	32	26	18	33	109
	0	0	0	0	0

	d	0	2	1	total
ua	41	69	25	28	163
	0	0	0	0	0

Table 1

Number of words having long and short vowels
in each ancient tone

i, u, e, (o, ʉ)

	d	0	2	1
1	-	-	0	0
s	+	+	A11	A11

ε, ɔ, (ə)

	d	0	2	1
	A11	A11	+	-
	0	0	-	+

a, (ʉ, o)

1	=	=	=	=
s	=	=	=	=

ia, ʉa, ua, (ə)

A11	A11	A11	A11
0	0	0	0

Table 2

Patterns of vowel length distribution in ancient tones

2. The /ia, ʉa, ua/ pattern

Vowel length in Thai is more a function of where the final consonant begins than where the vowel ends. And the point where a final consonant begins is more clearly defined in relation to tone shape than to time. The most important aspect of tone shape for present purposes is what we might call a tone's breaking point. This is the point where the tone's major change starts. Here are the five tones of modern Thai, as an example, arranged in order of the amount of time to their breaking points (times are given in milliseconds):[4] low (0), falling (75), rising (115), mid (235), high (245). There would appear to be a significant psychological time unit involved here since the interval to the breaking point of the rising tone is 'felt' while that of the falling tone isn't. Somewhere between the breaking points of these two tones, that is, is the threshold of some sort of a beat which separates the tones into two types. Rising, mid, and high tones are felt to have two parts (head and tail), while the falling and low tones are felt to consist of a single part.[5] Now if a final consonant begins in a tone's head, the vowel is short; and if it begins in the tail, the vowel is long. With /sǔŋ/, for example, the /ŋ/ begins during the head of the tone (before the rise starts, that is, and the pitch of the /ŋ/ starts low). But with /sǔuŋ/, the /ŋ/ begins during the tail of the tone (after the rise starts, that is, and the pitch of the /ŋ/ starts considerably higher). With one part tones, now, the dif-

ference between long and short vowels is not so clearly marked, and here
in lies the principal factor behind the history of vowel length change
in Thai.

The vowels /ia, ɨa, ua/, now, are not simply vowels without a length
distinction (and thus neither long nor short). They are long.[6] The com-
bination of two part vowels and two part tones, in fact, has probably
been the principal factor in maintaining the length distinction in Thai
up to the present time.

3. The /aa/ pattern

Notice that in our phonemic notation /aa/ can pattern either with
longs (/ii, ɨɨ, uu, aa/) or clusters (/ia, ɨa, ua, aa/). And notice that
this is more than a phenomenon of notation. You can actually make it
feel like one or the other by reading through one or the other of the two
progressions. So whereas /ia ɨa ua/ could set the basic framework for
a length distinction, /aa/ could serve as the pivot that extends this
framework onto all other vowels. Notice below how, with a change of
/ea oa/ to /ɛɛ ɔɔ/, a full-fledged vowel length opposition can be created
where only simple and clustered vowels existed before. To be sure, much
of the space is uninhabited (encircled vowels are unused by the lexicon
at first).
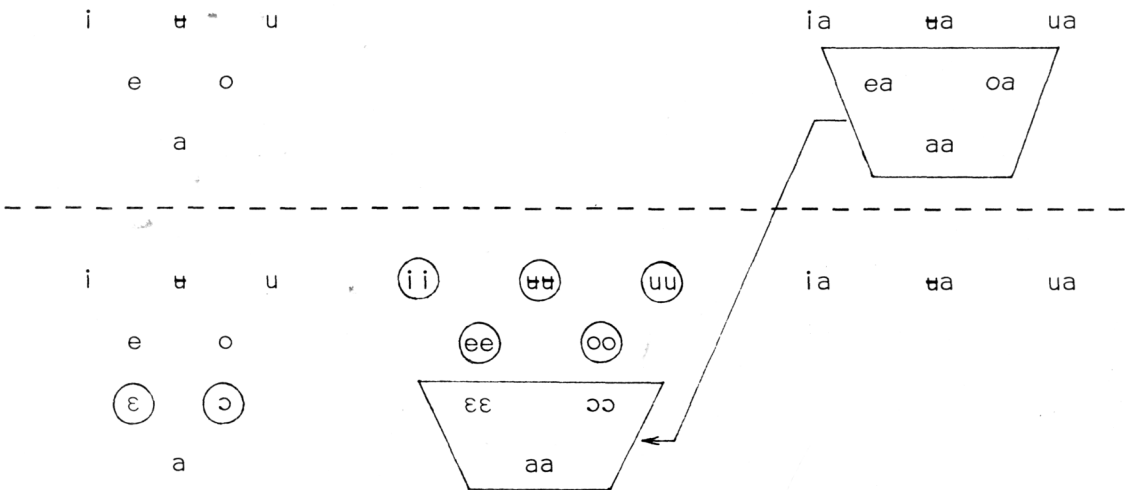
4. The /ɛ, ɔ/ pattern[7]

It is quite clear that this pattern is a development from the /ia, ɵa, ua/ pattern, but the details of just what happened and why may require some help from the following three theoretical concepts. (The last two have already been mentioned above.)

 a. The Chen-Wang concept of lexical diffusion (see Chen and Wang 1975). A phonological change in process (and the process might cover thousands of years) results from the balance of many different forces, and each word (in fact, each <u>nuance</u> or even each <u>instance</u> of each nuance of each word) presents a different overall balance of these forces. The change may thus proceed word by word through the lexicon. In fact, a particular word that presents a borderline balance of forces may proceed from 0 percent of its usages showing the change to 100 percent over a period of years.

 b. The concept of one and two part tones (see section 2 above). A two part tone provides a more stable environment for a two part vowel. All other things being equal, then, a change in process from long to short vowels will take place in one part tones first.

 c. The concept of the formation of uninhabited phonological space and its subsequent filling in. The clearest example of this for readers of the present volume will no doubt be the <u>máy trii</u> and <u>may càttawaa</u> space[8] which was formed in Thai by the great tone split (see Brown 1975). Such newly formed empty space starts to fill in--either from <u>within</u> (cross-overs of existing words, like /dǐaw/ from /diaw/ or /hɔ̌ŋ/ from /hɔ̂ɔŋ/) or from without (borrowings, like /bɔ̌y/ from English or /kúay tǐaw/ from Chinese; or new formations like nicknames /ʔúut/, /ʔíit/, /ʔɔ́ɔt/, /ʔɛ́ɛt/ or reduplications like /mɔm mɛm/).

Now on with the development of the /ɛ, ɔ/ pattern from the /ia, ɵa, ua/ pattern--or simply <u>the shortening of /ɛɛ ɔɔ/</u>. The statistical information given for /ɛɛ/ and /ɔɔ/ in Table 1 is broken down in Table 3 to include final consonants as well as more specific tone types. The number of words having long and short vowels is entered in each cell in that order (long/short).[9] The tone types are arranged from left to right and the final types from top to bottom in order of decreasing resistance to vowel shortening so as to call attention to the present boundary of the diffusion from long to short (shown with heavy lines).[10] The order of final types is the same for each table; that is, far-final, neutral final, near-final, and semivowel.

		Dead		Two part			MH2	One part	
		MHd	Ld	L2	MLO	HO	MH2	L1	MH1
		`	^	'	-	v	^	^	`
ε/	ŋ/k	16/0	7/0	3/0	21/1	13/2	5/0	1/7	0/10
	m/p	7/0	5/1	2/1	4/4	4/1	3/1	0/1	0/2
	n/t	6/0	2/2	2/0	9/1	8/0	0/2	1/7	0/3
	w			1/1	6/1	0/1	1/2	0/3	0/4
ɔ/	n/t	13/0	7/0	9/0	23/0	9/0	4/3	4/6	3/5
	m/p	10/0	7/0	5/0	12/2	5/0	3/3	0/7	0/8
	ŋ/k	18/0	10/0	6/0	30/1	9/1	0/9	0/13	0/7
	y			6/0	16/2	0/8	0/9	0/6	0/8

Table 3

Vowel length distribution tables for /ε/ and /ɔ/

But the table shows more than the present state of the diffusion:
it shows the results of filling in uninhabited space as well. /bɔm/
(from bomb) and /satεm/ (from stamp), for example, have nothing to do
with the advancing boundary of long-to-short crossovers. So if we want
to see the sharpest possible boundary of the present state of diffusion,
we should remove all cases of obvious borrowings and new formations from
the table. Or we could go all the way and use only words that we are
fairly certain came from ancient Thai (like the list of 1387 words given
in my 1965 book, p. 139). Doing the former leaves the boundaries exactly
as shown in Table 3 and removes 3 of the 6 aberrant /ɔ/-words and 10 of
the 19 aberrant /ε/-words. Doing the latter changes the boundary in the
/ɔ/ table to be identical with that of the /ε/ table, except that the

MH1-/n/ <u>words are all long</u> (/kɔ́ɔn/ and /ʔɔ́ɔn/);[11] and it removes 5 more
aberrant words.

I'll quit pretending, now, to work backwards through history from
the data shown in the tables and simply tell what I think happened.

Some time between one and two thousand years ago /ea/ and /oa/
changed to /ɛɛ/ and /ɔɔ/, and a whole new field of forces came into
being. These forces are shown below for one face of the three-dimensional
picture. The prechanged forces are shown to the left, and two competing
new tendencies are shown to the right.

pre-change			1			2		
i'	i:	ia	i'	i:	ia	i'	i:	ia
e'	e:	ea	e'	e:		e'	e:	
				ε		(ε')	ε:	

An apostrophe is used to mark shortness and a colon to mark length, here,
to call attention to the fact that they are both <u>marked</u>. /ia/, for
example, has <u>natural</u> (unmarked) length, but /i'/ is <u>unnaturally</u> short and
/i:/ <u>unnaturally</u> long. The extra effort implied by the word <u>unnatural</u> is
the energy of the opposition. In the first tendency shown above, /ε/
takes its natural length, since there is no length for it to keep clear
of. Natural /ε/ is somewhat shorter than natural /ea/ (which is identical
in length to unnaturally long /e:/). In the second tendency, /ε:/ follows
the template for vowel to final change points that all other vowels had
carved against the tone-shape metrics.[12] /ε:/, guided by the echo of its
two part origin (the changeover probably took hundreds of years, and during
this time speakers were always aware of the /ea/ possibility even as they
said /ε:/) tended to follow the long vowel change points; and this created
the uninhabited space /ε'/ (encircled in the chart above). These two ten-
dencies have existed side by side up to the present time. With one word
(or even one instance of using one word), one tendency might predominate;
and with another, the other.[13]

The /ɛ-ɔ/ space (the apostrophe has served its purpose and can be
dropped, and we can also go back to /ɛɛ/ instead of /ɛ:/) started to fill
in from without (borrowings and new formations) and from within (cross-
overs of existing words from the long space). And our main interest, now,
is the pattern of forces that pushed words into this new space over the
centuries (and will probably continue to do so for centuries to come).
Ancient tone 1 was a one part tone; tones 0 and 2 were two part. The two
part tone templates clearly marked the points where short and long vowels
ended and the finals began. But the one part templates were not so clearly

marked and were eventually overpowered by the forces of semivowel finals and the finals which had the nearest tongue position to the vowel (/n/ for /ε/, and /ŋ/ for /ɔ/).[14] And once words with these finals had crossed over, the overall balance was slightly more disposed to let other finals cross over as well. Tones divided and changed over the centuries and the forces changed accordingly, but by the time of the MH2 to L1 coalescence most /ε-ɔ/ words with a tone 1 origin were short and most of those with a tone 2 origin were long. With the completion of the tone coalescence, the crossover forces became identical. And all that separated the MH2 words from the L1 words was a lag of several centuries.

At this point I had better mention examples of forces that have acted in precisely the opposite way from those described above to make sure the reader doesn't get the idea that I'm claiming to have uncovered universal principles.

a. Whereas semivowel finals led the way in the present pattern and also with /iw/ and /uy/ in section 5, the opposite tendency seems to have worked with /ooy/.

b. While the tendency of near-finals to favor shortness is clearly supported by /ʉʉn, ʉŋ/ and /ʉʉt, ʉk/ in section 5, the opposite tendency is evident in the /iiŋ/ to /iŋ/ change of the same section. Another example of this reversal is shown below with modern high dead fill-ins. Slightly more than half of the cases support the shortening tendency of near-finals, but the boxed-in cases show the opposite tendency.

tík	ʔíit	ʔúut	túk
khéek	sakét	ʔóot	cóok
chɛ́k	ʔɛ́ɛt	chɔ́ɔt	chɔ́k

c. Even the most pervasive force of all, the tendency for vowels to shorten in one part tones, is reversed with /ay/ and /aw/ as in /dâay/ 'can' and /kâaw/ 'nine' (see p. 147 of Hartmann 1976 for more examples). And with the least congenial finals: semi-vowels (point a above).

I think that the obvious explanation is that what any force actually does depends on the overall field or system it encounters. Linguistics abounds with examples of opposites of this kind. My 1975 article, for example, explains two opposite developments of the great tone split with a difference of a few milliseconds of ear focus.

5. The /i, u, e/ pattern

Whereas the /ɛ, ɔ/ pattern is clearly one of long vowels becoming short, the /i, u, e/ pattern appears to be just the opposite. I had long thought that very early Thai had no vowel length, but only simple vowels and clusters (/aa/ being the same kind of cluster as /ia, ʉa, ua/); and that the development of vowel length in Thai was simply a combination of these two processes (/ea/ > /ɛɛ/ > /ɛ/ illustrating one process and /i/ > /ii/ the other). And I had fully intended to argue in this section that /ii/, /uu/, /ee/, and even /ʉʉ/ and /oo/ arose through the creation of an uninhabited long space (formed when /aa/ became interpretted as long /a/ instead of a cluster) and its subsequent filling in by crossovers, borrowings, and new formations (that is, the reverse of the /ɛ-ɔ/ story. The fact that no clear crossover pattern appeared and that the words in question just weren't the right kind to explain as borrowings or new formations was to be explained by a much greater time depth. But it just won't work. I am now convinced that what we've got is a length distinction wearing down--not short vowels building up. The /ɛ, ɔ/ development and the two suggested /i, u, e/ developments are compared schematically in table 4. Dashed and dotted arrows indicate progressively weaker tendencies.

Old patterns with changes   New patterns

/ɛ-ɔ/

	d	0	2	1
1	All	All	All	All
s	0	0	0	0

All	All	+	-
0	0	-	+

/i-u-e/ (wrong)

0	0	0	0
All	All	All	All

-	-	0	0
+	+	All	All

/i-u-e-o-ʉ/ (right)

=	=	=	=
=	=	=	=

-	-	-	-
+	+	+	+

Table 4

Schematic representation of various patterns of change

Most of the crossovers were very early, but a few were recent enough to be detected from comparative work. Fourteen long words that crossed over to shorts are listed on page 147 of my 1965 book. Six were in tone 0, three in tone 1, and five in tone 2. The crossover patterns were very similar to those described for /ɛ/ and /ɔ/ above. In fact it's all part of the same process. Long vowels have been wearing down for thousands of years. The /ɛ-ɔ/ erosions were more recent and hence more transparent; but once we detect their patterns of change, we can see that almost the same patterns were at work much earlier. The overall ordering of the forces affecting the long to short change seems to go like this.

      a. High to low vowels (with perhaps a slight tendency from front to back as well).

      b. One part tones to two part.

      c. Semivowel finals and near-finals to far-finals.

A word with /iiw/ in tone 1, for example, would have been among the very first to shorten; and a word with /ɔɔn/ (like /rɔ́ɔn/) may be among the last. (This doesn't include /aa/, of course. It will still be as strong as ever.)

Statistical tables of long-short occurrences for /i/, /u/, /e/, /o/, and /ʉ/ (similar to those for /ɛ/ and /ɔ/ in Table 3) are given in Table 5. Notice the reversal of /n/ and /ŋ/ with /i/ (/ŋ/ is the far-final and should thus be at the top). And notice the complete mix up with /o/. There does appear to be some kind of tendency, but the causation escapes me. Finally, notice that with /ʉ/ the /n/ final has not only resisted shortening; it has probably actually <u>lengthened</u> earlier short vowels. As an indication of where the most recent crossovers took place, the 14 words mentioned above as being long in an earlier stage are shown by dots in the tables. The dot below the 13 in cell /n/-0 of vowel /i/, for example, means that one of the 13 shorts was long about a thousand years ago and is thus a fairly recent crossover.

6. Still earlier guesses

We have guessed our way back through several thousand years now to the following vowel system.

i	ʉ	u		ii	ʉʉ	uu		ia	ʉa	ua
	e	o			ee	oo			ea	oa
	a				aa				(aa)

i/	d	0	2	1
n	15/20	6/13	0/7	0/10
m	18/17	5/13	0/5	0/8
ŋ	9/12	0/16	0/10	0/16
w		0/15	0/11	0/5

u/	d	0	2	1
n	18/25	10/20	0/7	0/18
m	12/22	5/14	0/6	0/16
ŋ	11/26	4/17	0/10	0/8
y		0/16	0/10	0/7

e/				
ŋ	14/7	11/13	4/2	0/12
m	2/7	5/4	0/2	0/1
n	14/26	11/15	0/5	0/7
w		4/2	0/0	0/0

ɨ/				
n	15/3	10/3	6/1	13/0
m	7/9	4/7	2/1	1/1
ŋ	0/24	0/21	0/5	0/11

o/	0	d	2	1
y	13/0		0/0	0/0
ŋ	19/27	18/29	4/1	17/6
n	18/25	22/29	4/10	2/11
m	11/23	3/23	1/4	0/7

Table 5

Vowel length distribution tables for /i, u, e, ɨ, o/

And /ea/ and /oa/ could have had /ɛɛ/ and /ɔɔ/ variants even then,[15] so the difference between this and modern Thai is very slight indeed. An uninhabited /əə/ space was created somewhere along the way and slowly started to fill in; but other than that, about the only change has been a gradual wearing down of clusters and long vowels. This change has gone all the way in some dialects (like White Thai, see Gedney 1964), but

in modern Thai it has done little more than change the statistics of long-short occurrences in different environments. A truly remarkable case of stability.

My original title for this paper was 'The development of vowel length in Thai', by which I meant how it came into being. But I had to change this when I found out that over the period I was investigating it didn't come into being at all. Hartmann (1976, p. 147) described my earlier position as seeing a waxing and waning of vowel length over time. But now it appears to me to be all waning and no waxing--and over a much longer time period than I had ever considered before. Well, I'm still interested in speculating on where vowel length came from, even though it takes me back further than I had originally intended to go. But this new guessing will have to be on quite a different level. I would describe the guesses made so far as good guesses: there were good reasons for every one and I would be surprised if the overall picture turned out to be wrong. But the guess I'm going to make now might better be called a wild guess: simply one of several possibilities that might possibly explain the situation. I wouldn't be surprised at all to find it to be wrong.

But even wild guesses should make sense. Like every other change in the universe, language change must follow an entropy increase. We expect sounds, like mountains, to wear down. To be sure, both mountains and sounds can build up, but then we must look for quite a different process: the result of something bigger wearing down. Any phonological system must come from an earlier system and go to a later one, and we should be able to make intelligent guesses both ways; but only if we follow the common sense of entropy flow. If we have reconstructed properly, our reconstructed system should look like it could wear down into the present ones. Consider our system shown above for an earlier stage of Thai. It is more complex than most. So, all other things being equal, we would expect its larger units to wear down (as, indeed, they have). But now consider where these larger units might have come from. We might look for still larger units--a still more complex system. But then where could that have come from? I think we've reached the point where we should consider the possibility of a complex syllable phonology being built up by something bigger wearing down.

I have long favored, as a source of tones in Thai, the possibility of a disyllabic language wearing down at its medial consonants. That is, the oral part of the medial consonant disappears but the laryngeal part stays. For example, bulan > bu-an > bu$^{\circ}$an; nasi > nahi > na^{1}i; makan > ma?an > ma^{2}an.[16] Now consider what this same process would do to vowels. Obviously it would flood the system with long vowels and clusters. In other words, it would give us just what we're looking for. And when a wild guess starts explaining things other than what it was intended to explain, then it would appear not to be so wild after all.

NOTES

1 John Hartmann (1976) gives a good recent review of the literature on the subject of vowel length in the Tai dialects. I will not try to duplicate this but will simply refer the reader to his article.

2 These numbers come from a syllabary of Thai that I had made in 1955. The Thai assistant considered every possible combination of initials, vowels, tones, and finals, and wrote in all the words that occurred to him. Inaccuracies abound, but they do not affect the statistics. Many /ɛ/ and /ɔ/ words that came up in the present investigation have been added to those of the syllabary, so the totals of these two vowels will be disproportionately high (the syllabary had 157 /ɛ-ɛɛ/ words and 272 /ɔ-ɔɔ/ words compared to the totals of 185 and 307 given in table 1). The notation used for ancient tones is d for dead (syllables with stop finals) and 0, 1, and 2 for live syllables with no tone marker, marker 1, and marker 2 in Thai writing.

3 Our definition of length in section 2 clearly does not allow treating /VVØ/ and /v?/ as /VV/ and /V/ (that is, as long and short varieties of the same thing).

4 These relative measurements were figured from the tables beginning on page 120 of Abramson 1962. They were purposely determined more impressionistically than mathematically. And longs and shorts were averaged together. The relative ordering of the breaking points is all I'm trying to show from these figures--not actual time lengths.

5 Actually, there are three one part tones. The high dead tone is a one part tone and thus goes with the high tone of pronouns (like /kháw/) and particles (like /máy/)--not with the usual high live tone. This treatment agrees with McFarland 1944 (though he doesn't include /kháw/ and the like). It is no coincidence, now, that the dead tones are precisely the one part tones, and that dead syllables are impossible with rising, mid, and high tones.

6 That is, they are long in relation to the shape of a two part tone; but they are not 'marked' (see section 4).

7 /ə/ should be included here, if at all. But I'm going to ignore it completely. It most likely had no source in ancient Thai (see page 44 of my 1965 book).

8 máy trii and máy càttawaa are the names of the tone markers used to write high and rising tones, respectively, with unaspirated stop initials. They have no source in ancient Thai.

[9] Since these figures represent a change-in-process, it is impossible to give accurate figures for long and short vowels (especially those near the boundary line). Different speakers differ considerably, and even the same speaker will change from time to time. When asked whether a borderline word is long or short, for example, the speaker might say that it can be either, or that it is in-between. The figures in the table, now, are based on the speech of a single speaker. Cases of in-between or one or the other with equal probability are counted as half and half (two such words in the same cell, for example, would add up to 1 long and 1 short). But fractions aren't entered. They are rounded off one way or the other on the basis of other information (like a preponderance of a pronunciation as seen from a questionnaire given to a larger group). In other words, I've tried to conceal the variability for the purpose of revealing the phonological determinants of the change. Obviously the variations concealed here could be the whole point of another study. In fact, this would seem to be a perfect place to study changes-in-process. A whole article could be devoted, for example, to a pair of 'homophones' in the cell that is right in the middle of the change (/m/-MH2). /sɔ̂ɔm/ 'to repair' and /sɔ̂m/ 'fork' were once homophones; but right now 'fork' is just a shade ahead of 'repair' on their way from long to short.

[10] To get a picture of the progression of this change over the centuries, imagine a left sloping diagonal (the boundary between long to the left and short to the right) moving leftward across the table as shown below.

$$\boxed{}\!/ \quad > \quad |\diagdown| \quad > \quad |\diagdown| \quad > \quad /\boxed{}|$$
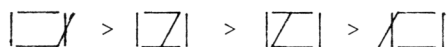
The change is now at about the stage of the second figure: that is, less than half way through.

[11] The L1-/n/ cell (which would thus enisle the MH1-/n/ cell) has 4 perfectly normal Thai-looking words that are good and long (no variation), but which don't occur in the 1387 word list; so there isn't a discontinuity in the table. The three rightmost /n/ cells, which should be centuries apart in the advance of the diffusion boundary, seem to have stabilized. Final /n/, fighting against the change, and the one part tones, fighting for it, seem to have fought to a standstill.

[12] Here, for example, is a rising tone template for short and long vowels.
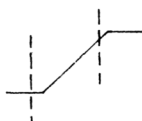
Without the template (in low tone, for example) the new /ɛ/ would more naturally take an in-between endpoint. But with a rising tone, the clear template pushes for either an earlier or later ending.

13 Here's a typical example of both tendencies at work. An informant will easily call /phêɛt/ 'doctor' long and /lêt/ 'brazen' short. But he doesn't want to be forced to choose with /rêɛt/ 'rhinoceros'. If you give him a three-way choice, he will happily call 'rhinoceros' in-between. Does this mean there's a three-way distinction? I think not. I think that the first two words here follow tendency 2, while the third follows tendency 1.

14 The force of near and far finals had been so strong with the vowel /ɨ/ much earlier (see section 5) that all /ɨɨŋ ɨɨk/ words changed to /ɨŋ ɨk/ and almost all /ɨŋ ɨt/ words changed to /ɨɨŋ ɨɨt/.

15 Vietnamese has a vowel system which is even closer to this than many Thai dialects; and I have heard allophones of /ɛ/ and /ɔ/ from a young Saigon speaker which sounded exactly like /ea/ and /oa/ to me.

16 We need look no further than American English for an example of the first step in this change (mountain > /mawnʔən/) and no further than Scandinavian languages for an example of the second step (the glottal stops of Danish and the 'tones' of Swedish and Norwegian).

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