

# THE BRŪ VOWEL SYSTEM: ALTERNATE ANALYSES

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0. Introduction. It has been a basic assumption of linguists concerned with the descriptive analysis of languages that the sounds of any language tend towards symmetrical patterning. But languages change and their sound systems change. Linguists studying a language at one particular point in time are often (perhaps always) faced with data that are not completely symmetrical. Several systems may be applicable to the data, not one of which fits perfectly. One of the more perplexing preliminaries to a phonemic description is to weigh the several systems which could possibly be applied to a language in order to determine which of them constitutes the neatest and most complete ordering of the data.<sup>2</sup>

This paper is such a preliminary consideration of the possible analyses of the vowel sounds of the Brū language.<sup>3</sup> One system is

here used to introduce the data in an orderly fashion. Then weaknesses of this system are noted, and other possibilities are tried and evaluated.<sup>4</sup>

Adding special interest and complexity to this problem is the fact that the Brū language has forty-one vowel sounds, if the vowels in all combinations with their modifying factors such as length are counted.

## 1. Presentation of Brū vowels according to the Register System.

1.1 The basic vowels and their modifications. The Brū vowel system may be said to consist of ten basic vowels:<sup>5</sup>

	Front	Central	Back
High	i	ɯ	u
Mid	ê	ɔ	ô
Low	e	a	o

Vowels may occur in three degrees of length: Short, regular and glided. (See Table I.) High and mid vowels may occur with one of two registers. The register contrast has been found to occur with all regular and glided (high and mid) vowels, except for the glided /ɔa/; it has been found to occur with only one of the short vowels, /ɯ/.

	Front			Central			Back					
	Short	Reg.	Glided	Short	Reg.	Glided	Short	Reg.	Glided			
High	Loose	ĩ	ì	ìa	ũ	ù	ùa	ũ	ù	ùa		
	Tight		i	ia	ũ	ɯ	ɯa	u		ua		
Mid	Loose	ě	è	èa	ɔ	ɔ	ɔa	õ	ò	òa		
	Tight		ê	êa		ɔ			ô	ôa		
Low		ě	e	ă	a	aa	ã	ɑ	ɑa	õ	o	oa

Table I

An arrangement of Brū vowels following the Register System described in section 1.

1.1.1 The Register contrast. The register contrast, as Phillips has described it for several Mon-Khmer languages,<sup>6</sup> is a contrast between tight and loose vowel articulations. First register Brū vowels are said with the vocal cords rather tense and often with

slight faucalization. Second register vowels are said with relatively relaxed vocal cords, producing a rather deep and muffled sound. This deepness has nothing to do with pitch. Pairs of words differing only in register are said on the same pitch, whether uttered in isolation or in the normal flow of speech.

Two other phonetic features occur along with the first and second registers in Brū. A first register vowel, for the greater part of its duration, is lower in tongue height than the corresponding second register vowel. A first register vowel ends in an offglide that rises slightly toward a higher tongue-height position, whereas the corresponding second register vowel is unglided. This upgliding is more pronounced for vowels of regular length than for other vowels. Of the three cooccurring features--register, tongue-height and upgliding--only one need be considered phonemic. In this section we tentatively choose register as the determining contrast and consider the other features redundant. The other possibilities are explored in section 2.

The fact that the register contrast is significant with high and mid vowels is demonstrated by the following examples. The words in opposite columns differ only in that one word of each pair occurs with first register and the other with second. (Second register is marked with a grave accent. Vowel shortness is marked with a breve accent, and vowel gliding is shown by adding an /a/ after the main vowel. Words between slant lines are written phonemically according to the system here proposed--that is, register differences are marked, but slight tongue height and upgliding differences are not. A phonetic transcription, showing all three types of differences, follows.)

## Words with first register

/pih/ [pi<sup>h</sup>] 'to break'  
 /tê/ [te<sup>v</sup>e] 'from'  
 /katu<sup>?</sup>/ [kat<sup>i</sup>v<sup>i</sup>?] 'a tapeworm'  
 /pɔ<sup>?</sup>/ [pə<sup>v</sup>ɔ<sup>?</sup>] 'to go'  
 /kut/ [ku<sup>v</sup>ʉt] 'to divide in half'  
 /tôŋ/ [to<sup>v</sup>oŋ] 'to push up'  
 /tian/ [ti<sup>v</sup>ʌn] 'money'  
 /têan/ [ti<sup>v</sup>ʌn] 'to wrap tightly'  
 /cūaŋ/ [cū<sup>i</sup>v<sup>i</sup>ŋ] 'a well'  
 /cūap/ [cū<sup>v</sup>əp] 'around'  
 /tōaŋ/ [tu<sup>v</sup>ʌŋ] 'to strike metal'

## Words with second register

/pih/ [pih] 'poison'  
 /tê/ [tê] 'with, also'  
 /katu<sup>?</sup>/ [kat<sup>i</sup>?] 'to push away'  
 /pɔ<sup>?</sup>/ [pə<sup>?</sup>] 'to look under'  
 /kùt/ [kùt] 'to bend down'  
 /tòŋ/ [tòŋ] 'male (fowl)'  
 /tìan/ [tìʌn] 'to add to'  
 /tèan/ [tèʌn] 'a candle'  
 /cūaŋ/ [cū<sup>i</sup>ŋ] 'to give birth (pig)'  
 /cūap/ [cū<sup>v</sup>əp] 'to be about to'  
 /tòaŋ/ [tù<sup>a</sup>ŋ] 'a pipe stem'

1.1.2 **The length contrasts.** Vowels may occur in three degrees of length. All vowels may be either regular in length or short, and all but /e/ may also be glided.

For the high and mid vowels where the register contrast may

occur, length and register are independent of each other in distribution. The only apparent restrictions on the cooccurrence of length and register are the following: Only one short vowel, short /ū/, may show contrastive register. Only one glided vowel, /da/, has not been found with contrastive register.

Regular vowels of either register are of equal phonetic length, although the first register vowel is glided and the second is not.

Short vowels are of notably shorter phonetic length than regular vowels and of approximately the same tongue height. With the exception of /ã/ and /ð/ short vowels are limited and irregular in distribution. They do not occur in open syllables.

The following examples demonstrate the contrasts between short and regular length vowels:

#### Short Vowels

/piŋ/ 'sound of pounding'

/kêŋ/ 'glass'

/têh/ 'to hammer'

/kūyʔ/ 'to pick (squash)'

/kūt/ 'to cut'

/kōp/ 'with'

/tāŋ/ 'to hold (fortress)'

/nāʔ/ 'how'

/tūn/ 'deaf'

/kōk/ 'abundant'

/sōk/ 'hair'

#### Regular Vowels

/piŋ/ 'side of waist' /piŋ/ 'grave'

/kêŋ/ 'edge' /rakêŋ/ 'protective rail'

/teh/ 'water leech'

/kūyʔ/ 'to tunnel'

/kakūt/ 'to wobble'

/akōp/ 'kind of toad' /kōp/ 'shoe'

/taŋ/ 'in place of'

/amaʔ/ 'little girl'

/tun/ 'sound of falling' /atun/  
'distended'

/kōk/ 'classifier' /kōk/ 'devoid  
of vegetation'

/sok/ 'to harvest rice'

Glided vowels are of approximately the same phonetic length as regular vowels. They differ in that the former are characterized by glides which move toward a lower and more central position. The glided high vowels, /ia/, /iã/, /ua/, /uã/, /ua/, /uã/ glide down to a mid central vowel. The glided mid central vowel /da/ glides to another mid central vowel lower than the first. The glided front and back mid vowels /êa/, /êã/, /ôa/, /ôã/ glide to a low central vowel; that is, they glide lower than any of the other glided vowels mentioned above.

All six high glided vowels and the four front and back mid glided vowels are off glides, the syllable peak being on the first part of the vowel. (See phonetic examples on page 205.) The mid central glided vowel /da/ and the low back glided vowel /oa/ give approximately equal time to their two parts. The second part of /oa/ is slightly lower and more central, but it is not as central as /a/ and is strongly

rounded. [tɨ̃ʋŋ] 'noon' [tooʋŋ] 'door'. The low central vowels /aa/ and /a/ are on-glides, the syllable peak being on the last part of the vowels. They begin with a brief central vowel and then glide down to the normal front-central and back-central positions respectively.<sup>7</sup> [m<sup>o</sup>ak] 'to pierce ears' [m<sup>a</sup>ak] 'to eat with fingers'

The following examples demonstrate the contrasts between glided and regular length vowels:

Glided vowels	Regular vowels
/tɨ̃an/ 'money'	/tin/ 'to crush'
/wɨ̃al/ 'to circle'	/wil/ 'village'
/têah/ 'vare of vegetation'	/têh/ 'to sleep by fire'
/lêaʔ/ 'to be bad'	/lêʔ/ 'to exchange'
/čvãʔ/ 'pineapple'	/čvʔ/ 'a number, letter'
/satũaʔ/ 'cockroach'	/katũʔ/ 'to push away'
/pɔaʔ/ 'to cut vines, etc.'	/pɔʔ/ 'to go' /pɔʔ/ 'to look under'
/kaaŋ/ 'hard'	/kaaŋ/ 'a rectangular basket'
/araaʔ/ 'frog'	/amaʔ/ 'little girl'
/tuaŋ/ 'a kind of potato'	/tuŋ/ 'sound of falling'
/aluay/ 'a gourd'	/lũy/ 'dull'
/tôaŋ/ 'to strike metal'	/tôŋ/ 'to push up'
/tôaŋ/ 'a pipe stem'	/tôŋ/ 'male (fowl)'
/toaŋ/ 'door'	/toŋ/ 'handle'

1.1.3 The low vowels. The low vowels /e/, /a/, /a/, and /o/ may show a length contrast but not a register contrast. They occupy front, front-central, back-central and back positions. The back-central /a/ is unrounded, and the back /o/ is strongly rounded.

The distribution of /a/ is very limited. Short /ã/ and glided /aa/ have been found only before /k/, /ʔ/, /ŋ/, and /h/, and regular /a/ only before /ʔ/. In all of these positions, /a/ in its various lengths is in contrast with the corresponding length of /a/. /tãŋ/ 'handle' /tãŋ/ 'to hold (fortress)'; /amaʔ/ 'little girl' /maʔ/ 'newly germinated rice'; /taaŋ/ 'to worship' /ataaŋ/ 'long horned'.

/a/ is also in contrast with the low back vowel /o/ in all positions where the former may occur. /o/ in all of its lengths is strongly rounded, but short /õ/ and glided /oa/ are slightly higher in tongue height than their regular counterparts. /tãŋ/ 'handle' /tõŋ/ 'to load a bow'; /daʔ/ 'to put' /hoʔ/ 'relatives', /taaŋ/ 'to worship' /toaŋ/ 'door'.

Another low vowel, /e/, is also limited in distribution, occurring in both lengths only before /k/, /ʔ/, /ŋ/ and /h/, but in these positions it contrasts with the corresponding length of /a/. There is no glided low front vowel in any position in contrast with regular /e/

before /h/ demonstrates a slight phonetic on-glide. /tēŋ/ 'to dam' /tāŋ/ 'to hold (fortress)'; /teŋ/ 'to speak frankly' /taŋ/ 'in place of'.

Regular lengths of /a/, /ɑ/, and /o/ have not been found to occur before /h/.

## 1.2 Problems with this analysis.

1.2.1 Neither length nor gliding is a completely adequate term for distinguishing what we have called regular and glided vowels. The glided vowels are about the same phonetic length as the regular vowels. As for gliding, some of the regular vowels are also glided. First register regular vowels glide upward, whereas the "glided" vowels glide downward.

It would not be a helpful solution to the dilemma to treat the glided vowels as clusters of the two vowels. Glided vowels and regular vowels have similar distributions and so should be treated in similar ways. Both are units rather than clusters.

1.2.2 The front and back mid glided vowels, /êa/, /ê̂a/, /ôa/, and /ô̂a/ do not completely parallel the rest of the glided vowel system. Their offglides are different in several ways from that of the central mid glided /da/. /da/ gives equal timing to the two parts of the vowel; /êa/, /ê̂a/, /ôa/, and /ô̂a/ give most of the time to the first part. /da/ ends in a central vowel [ə], as the high glided vowels also all tend to do; /êa/, /ê̂a/, /ôa/ and /ô̂a/ end in a low [a].

/êa/, /ê̂a/, /ôa/ and /ô̂a/ also differ from the pattern of the high glided vowels. First and second register high glided vowels begin on the same level as their regular length counterpart and glide downward. /êa/, /ê̂a/, /ôa/ and /ô̂a/ begin much higher than do their regular length counterparts--just as high, in fact, as do the high glided vowels. The phonetic difference between /ia/ and /êa/, /îa/ and /ê̂a/, /ua/ and /ôa/, /ûa/ and /ô̂a/ is entirely in the offglide. The main vowels are the same. The mid vowels can be considered lower only because their offglides end lower.

Removing /êa/, /ê̂a/, /ôa/ and /ô̂a/ from the main vowel system to relieve the asymmetries caused by their presence, would only produce worse asymmetries. They could not be interpreted as semi-vowels plus /a/ since /êa/ may occur following the semi-vowel /y/, (/yêaŋ/ 'spirit'), just as /îa/ may (/aylɑl/ 'a bat'). They should not be interpreted as clusters of two vowels for the same distributional reason as was mentioned in section 1.2.2. Also, while adding two diphthongs to the vowel system, they would leave "holes" in the regular ten-vowel system at the points where glided mid vowels would be expected in a balanced pattern.

1.2.3 The low vowels differ basically in pattern from the mid and high vowels. The low vowels have no register contrast, while the others do. The low vowels are arranged in four positions from front to back, as compared with three for the others. If, alternatively, one preferred to consider /a/ a front vowel and /ɑ/ a back vowel, making four levels of tongue height, the symmetry would not be improved. There would be two levels with the register contrast, with three positions from front to back, and two levels without the register contrast, with two positions from front to back. But the additional level is unnecessary. /ɑ/ would be grouped with the back rounded vowels despite its total unrounding.

1.2.4 The defective distribution of the /ɑ/ vowel at the present stage of the language would make for asymmetry in any system.

1.2.5 Only for /ð/ is there a contrast between two short vowels. Whether the absence of the contrast for the other short high and mid vowels, or the presence of it for this one should be considered unusual is immaterial here. (We prefer the latter.) Either way the system is asymmetrical at this point.

1.2.6 Although register has been taken as the significant contrast in this system, rather than the cooccurring tongue height and up-gliding distinctions, there is no clear tight-loose contrast between short /ū/ and /ũ/. The most noticeable difference between the two is that /ū/ is said with lower tongue height than is /ũ/. This is the only case among the high and mid vowels where register and tongue height have not acted together.

2. Alternate Analyses. It has already been seen that, in much of the language, register, tongue height and up-gliding distinctions occur together. Only one of these three need be considered significant, the other two then being redundant features. In section 1, a system based on a register contrast (hereafter called the Register System) was presented. The system, although adequate for much of the data, did not perfectly and symmetrically accommodate the whole language. In section 2, other major possible systems are explored and evaluated by comparison with the Register System.

2.1 Extra Levels System. This system substitutes extra contrasts in tongue height in place of the register contrast. It results in a system with five degrees of tongue height, and with the same front to back positions as in the Register System.

For easier reading, we write the vowels here with the same symbols as were used in Table I or section 1. But the grave accent no longer has any reference to register. A vowel with the grave accent is simply on the next higher level from the corresponding unaccented vowel. For example, the vowels /î/, /i/ and /ê/ are con-

2. 2 The Gliding System. Another alternative would be to treat gliding rather than register as the significant contrast. The vowels would then be divided according to gliding or non-gliding, with the upglided vowels /i/, /e/, /ɛ/, /ɪ/, /d/, /n/, /o/ being counted among

misleading. If so, the artificial symmetry of the Extra Levels System is only mirror an essential lack of symmetry in the language at those points. There is a resulting loss in symmetry at certain points, the fact that the Register System does show these internal relationships; and if such a patterning, the system should show it rather than obscure it. Close vowels and between the unglided open ones. Where there is levels, as if there were no special relationship between the glided able in Brd as to arrange American English from vowels in five tends to obscure this clear relationship. This would be as undesirable in looseess and nongliding. The Extra Levels System are similar in tightness and upgliding; vowels of first and third levels evidence of an internal structure. Vowels of second and fourth levels are similar in tongue height. But such is not the case. There is plies a rather homogeneous structure within each rank based on regular differences in tongue height. Another basic weakness of the Extra Levels System is that it implies a rather homogeneous structure within each rank based on regular differences in tongue height. But such is not the case. There is evidence of an internal structure. Vowels of second and fourth levels are similar in tightness and upgliding; vowels of first and third levels are similar in looseess and nongliding. The Extra Levels System tends to obscure this clear relationship. This would be as undesirable in Brd as to arrange American English from vowels in five levels, as if there were no special relationship between the glided close vowels and between the unglided open ones. Where there is such a patterning, the system should show it rather than obscure it. The Register System does show these internal relationships; and if there is a resulting loss in symmetry at certain points, the fact that only mirror an essential lack of symmetry in the language at those points. If so, the artificial symmetry of the Extra Levels System is misleading.

It might be possible to leave /ca/ and /o/ in the main vowel system without creating the vowel height problems of the previous paragraph. This would reduce the number of diphthongs to two: /ea/ and /oa/. But treating the closely related vowels /ea/ and /ea/ in vastly different ways, one in the main vowel system and one outside, would be unrealistic and undesirable.

The diphthongs are forced out of the main vowel system, because they cannot fit in the upper-mid and mid vowel positions in a system where the vertical distinctions in the vowel chart are entirely those of tongue height. /ea/ and /oa/ are distinctly higher during most of their duration than /ia/ and /ua/. To move /ia/ and /ua/ down to their position and insert /ea/ and /oa/ in lower-high position would result in a mixing of glided vowels with different types of down-glides, and a separating of those that phonetically fall close together. For example, in any vowel system /ua/ and /ua/ should be placed near each other since they differ only slightly in tongue height, and end with the same mid central glide, whereas /oa/ and /oa/ end in a low central glide. In the Register System, /oa/ and /oa/ were able to fit in the main vowel system as mid vowels because their register contrast paralleled that of the high vowels /ua/ and /ua/. The unequal vowel height difference was less important. In the Extra Levels System, vowel height is paramount, and the diphthongs must be treated separately.

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It might be possible to leave /êa/ and /ôa/ in the main vowel system without creating the vowel height problems of the previous paragraph. This would reduce the number of diphthongs to two: /êa/ and /ôa/. But treating the closely related vowels /êa/ and /êa/ in vastly different ways, one in the main vowel system and one outside, would be unrealistic and undesirable.

Another basic weakness of the Extra Levels System is that it implies a rather homogeneous structure within each rank based on regular differences in tongue height. But such is not the case. There is evidence of an internal structure. Vowels of second and fourth levels are similar in tightness and upgliding; vowels of first and third levels are similar in looseness and nongliding. The Extra Levels System tends to obscure this clear relationship. This would be as undesirable in Brū as to arrange American English front vowels in five levels, as if there were no special relationship between the glided close vowels and between the unglided open ones. Where there is such a patterning, the system should show it rather than obscure it. The Register System does show these internal relationships; and if there is a resulting loss in symmetry at certain points, the fact may only mirror an essential lack of symmetry in the language at those points. If so, the artificial symmetry of the Extra Levels System is misleading.

**2.2 The Gliding System.** Another alternative would be to treat gliding rather than register as the significant contrast. The vowels would then be divided according to gliding or non-gliding, with the upglided vowels /i/, /ê/, /u/, /ô/, /u/, /ô/ being counted among

the glided. (See Table III.)

		Front		Central		Back	
		Unglid.	Glid.	Unglid.	Glid.	Unglid.	Glid.
High	Long	ì	ìa	ù	ùa	ù	ùa
	Short	ĩ	i	ũ	ư	ũ	u
Lower-high			ia	ũ	ưa		ua
Mid	Long	è		ò	ơa	ò	
	Short	ẽ	ê	ơ	ơ	õ	ô
Low	Long	e		a aa	a aa	o	oa
	Short	ẽ		ã	ã	õ	

#### Diphthongs

	Front	Back
High	èa	òa
Mid	êa	ôa

Table III

An arrangement of Brū vowels following the Gliding System described in section 2.2

With the diphthongs removed from the main system and with another partly-filled level of vowels inserted between the high and mid vowels, the remainder of the system never has more than two glided vowels which may occur with a maximum of two two-way contrasts, one glided vs. nonglided and the other, for want of better labels, long vs. short. The lower-high vowels have no long-short contrast. The glided vowels have a long short contrast only for high vowels and the mid central vowel.

**2.2.1 Advantages.** In simplicity and compactness this system is superior to the others that have been presented. The bi-dimensional two-way contrast gives theoretically four possible variations on each basic vowel. The Register System, with a three-way length contrast and a two-way register contrast, allows theoretically for six possible variations; and in reality that system requires a fairly long list of statements of non-contrast at points where there would be room for contrast in the structural framework.

Although the introduction of an extra level is not an advantage it does offer another means of treating the high vowels which are rather crowded in the Register System. The Gliding System handles the high vowels in a completely regular way and treats the overflow as an emerging and not yet fully developed extra level. This extra level has the full gliding contrast for the central vowel.

For languages in Viet Nam with vowel length or register contrasts it is not uncommon for the vowels of one series to have more contrasting levels of tongue height than the vowels of the other series. For example, in Bahnar and Mnong Bunɔr, regular vowels occur in three levels and short vowels in only two. If then in Brū, according to the Gliding System, an extra level occurs with the full gliding contrast in the central position but with no length contrast, that fact is not in itself a serious asymmetry.

2.2.2 Disadvantages. It has been mentioned that, in the extra level, the central vowel has the full gliding contrast. But the nonglided and glided vowels in this level are not well matched. In other cases, wherever a length contrast occurs with glided vowels, the gliding contrast matches the short nonglided vowel with the so-called short glided (that is, upglided) vowel. But here in the lower-high level the short nonglided vowel is made to contrast with a phonetically downglided vowel, quite contrary to the pattern elsewhere. It is only the lack of length contrast that to any degree allows the gliding contrast to be considered valid. If the system were changed to accord with phonetic facts and to the pattern elsewhere, a length contrast would have to be added to the lower-high level. And the advantage of compactness, which was the main appeal of the Gliding System would prove to be illusory.

Labelling one of the two contrasts in this system as the "short vs. long" contrast is not completely satisfactory. The label is well suited to the nonglided vowels, since a short nonglided is distinctly shorter than the corresponding long nonglided. The label is not well suited to the glided vowels. Glided vowels are of equal phonetic length. They differ in that the "long" glided vowels are downglided and of second (loose) register, and the "short" glided vowels are upglided and of first (tight) register.

Nor would a register contrast label be satisfactory over the whole system in place of the length label. (In Table III this would involve changing all "long" labels to "second register" and "short" to "first register".) All phonetically short vowels, then would be called first register nonglided. But for these vowels no register contrast has been observed. Applying the register label to low vowels would be especially arbitrary, since even in the Register System these vowels were not affected by that contrast. To correct this by restricting the register contrast from occurring with the low vowels would only

be to substitute a weakness of the Register System in place of the arbitrariness of the Gliding System at this point. All vowels in the lower-high level, with the exception of the indeterminate /ū/, are phonetically tight; but to call them all first register vowels would produce a basic contradiction to the pattern elsewhere, since for all the glided vowels on this level the offglide is downward rather than upward.

Even among the glided vowels there is a difficulty connected with defining the contrast in terms of register. It is quite true, for example, that second register /ua/ contrasts with first register /u/; but it also contrasts with first register /ua/. In all other ways /ua/ is much more similar than /u/ to /ua/. If register is the significant contrast, then /ua/ is certainly the counterpart of /ua/.

Length, then describes the contrast between nonglided vowels, and register describes the contrast between glided vowels, but neither one adequately serves for both.

This fact suggests another variant of the Gliding System which should divide vowels into short, regular and glided types, with the glided vowels further differentiated as being either downglided or upglided. This in effect applies the long-short contrast only to nonglided vowels. But this again would lose the advantage of compactness. It would retain the extra level with all its associated inconsistencies, and that level would seem even more incomplete with no regular vowels.

Along with introducing three new basic vowels on a new level, the Gliding System treats the diphthongs separately from the main vowel system. They may be considered as four diphthongs occurring two each on high and mid levels as in the Extra Levels System. Or, if register is taken as one of the significant contrasts in this system, the diphthongs may be reduced to two basic ones, each of which may occur with first or second register. (There would be no phonetic justification in setting up two diphthongs modified by either length or gliding contrasts.) Either way the diphthongs constitute an asymmetrical feature.

Bringing the tight diphthongs /êa/ and /ôa/ into the main vowel system as long glided mid vowels would fill two holes in the pattern and reduce the number of diphthongs. But the disadvantage of this plan, mentioned once already in connection with the Extra Levels System, hold true here too.

**2.3 The Vowel States System.** A possibility, which should at least be examined, is that of abandoning the attempt to cover the whole vowel field with either a length or a register contrast. Vowels may be said to occur in one or another of five contrasting states: regular, short, upglided, downglided or diphthongized with a following /a/.

(See Table IV.)

	Front					Central				Back				
	Regular	Short	Uplided	Downglided	Diphthongized	Regular	Short	Uplided	Downglided	Regular	Short	Uplided	Downglided	Diphthongized
High	ì	ĩ	i	ìa	ẽa	ú	ũ	u	úa	ú	ú	u	úa	õa
				ia			ũ		ua				ua	
Mid	è	ẽ	ê		êa	ò	õ	o	óa	ò	õ	ô		ôa
Low	e	é				a	ã	aa		o	õ			oa

Table IV

An arrangement of Brū vowels following the Vowel States System described in section 2.3

2.3.1 Advantages. This system avoids forcing a three-way length contrast which is not borne out by phonetic facts. It avoids applying a register contrast to the vowel field and then adding many statements as to instances of noncontrast.

It treats distributionally similar units such as downglided vowels and diphthongs in similar ways.

2.3.2 Disadvantages. It is immediately evident from Table IV that the high vowels cannot all be accommodated by this system without either the setting up of another level or the addition of two extra vowel states. Either method introduces further complexity.

With the problematical high vowels momentarily ignored, the system is left with five contrasting states for high vowels, four for mid, and never more than three for low. If high /ia/, /úa/, /ua/ were then considered mid downglided vowels to contrast with the mid vowels /êa/, /óa/, /ôa/ (now considered diphthongs), both high and mid vowels would occur in five states. This would be an improve-

ment in symmetry, but it would still leave problems. Short / $\tilde{u}$ / would still not have been cared for. / $\sigma a$ / (or possibly / $\tilde{u} a$ /) would have to be quite arbitrarily designated a diphthong rather than a downglided vowel, and it would then be the only central diphthong.

Another possible variation of this system would be to drop out the diphthongized state and substitute a modified downglided state that would accommodate / $\tilde{i} a$ /, / $\tilde{u} a$ / and / $\tilde{u} a$ / among the normal high vowels; / $\tilde{e} a$ / and / $\tilde{o} a$ / would be moved down to mid downglided positions in the same columns as / $\tilde{i} a$ / and / $\tilde{u} a$ /, respectively. To accord with phonetic facts, the difference between the two downglided states would have to be stated in terms of register or of tongue height. Either one would likewise describe the contrast of short / $\tilde{u}$ / and / $\tilde{u}$ /. It is also operative between regular / $\tilde{o}$ / and upglided / $\sigma$ /. This would lead directly to either the Register System or the Extra Levels System.

Even apart from the asymmetries of the Vowel States System, a basic weakness of the system is that it obscures important internal relationships. This was a criticism raised against the Extra Levels System. It is even more pertinent here where correlations both of register and of tongue height are ignored.

3. Conclusion. It has been seen that none of the systems which can be used to describe the vowels in Brū is without asymmetries and discrepancies. It is our feeling, however, that the internal relationships brought out by the Register System and obscured by the other systems are of basic importance. Also the handling of the diphthongs within the main vowel system is a considerable advantage of this system over the Extra Levels System and the Gliding System. For these reasons we feel that the Register System gives a more complete and accurate ordering of the total data than do any of the other three systems.

#### FOOTNOTES

1. Richard L. Phillips is serving under the Christian and Missionary Alliance. John and Carolyn Miller are working under the auspices of the Summer Institute of Linguistics. [Editors' Note: This paper, written well over a decade ago, represents an early milestone in our progress towards understanding the intricacies of register effects on vowel systems of Mon-Khmer languages of Vietnam.]
2. Laurence C. Thompson, for example, presents Vietnamese as a language with numerous asymmetrics in its sound structure.

"Saigon Phonemics," Language 35. 454-76 (1959). Thompson gives special attention to its "problems of indeterminacy, multiple analysis, and asymmetry." (454). Yet he does so against a background of recognizing the basic regularity of the greater part of the data. Asymmetrical features, then, stand out from the ordered whole, and different features show the asymmetry when different systems are applied to the language.

3. Brū is a language of the Mon-Khmer family. The dialect represented here is spoken in the northwest corner of South Vietnam in the Hương Hóa district of Quang Trị province. Hương Hóa district contains approximately 15,000 Brū speakers. Estimates of the total Brū population vary from 30,000 to 50,000 including speakers in North Vietnam and Laos.
4. The prevailing word pattern of Brū is CVC/CCVC in which CVC represents a non-stressed, non-obligatory pre-syllable and CCVC a stressed, obligatory main syllable. The pre-syllable exhibits a high degree of vowel neutralization with very little vowel contrast, whereas the main syllable demonstrates full contrast between all vowels.

Brū has twenty-three consonant phonemes as follows: /p/, /t/, /ʃ/, /k/, /ʔ/, /ph/, /th/, /kh/, /b/, /d/, /m/, /n/, /ñ/, /ŋ/, /l/, /r/, /s/, /tr/, /h/, /w/, /y/, /ʔw/, /ʔy/.

5. Vowels are here written to conform with Vietnamese orthography. In customary linguistic notation these ten basic vowels would be written as follows:

i	ɨ	u
e	ə	o
a	ɑ	

6. See Phillips, Richard L., "Vowel Distribution in Hrê," and "Mnong Vowel Variation with Initial Stops," in Mon-Khmer Studies IV 63-68, 119-128 (1973).
7. The /a/ in /**a**a/, as in all other glided vowels, is merely the signal that the /**a**/ vowel is downglided. The phonetic transcription of /**a**a/ would be [ **a**a ], with the symbols standing in reverse order.