

# THE DISTRIBUTION OF PHONEMES IN AUSTRALIAN ABORIGINAL LANGUAGES

PETER A. BUSBY

## ACKNOWLEDGEMENTS

This research was carried out as a part of postgraduate studies at the Australian National University in 1978-79. I wish to thank in particular Dr David Bradley and Professor R.M.W. Dixon of the Department of Linguistics, School of General Studies, as well as Dr Michael Walsh of the Australian Institute of Aboriginal Studies.

## INTRODUCTION

The aim of this paper is to present an analysis of the phonological systems of Australian aboriginal languages. For such an analysis it is necessary to examine the types of phonemes that constitute a phonological system and the contrasting characteristics of the systemic arrangements.

The approach adopted looks at the types of position of articulation arrangements within manner of articulation classes. Of all the possible combinations that are permutable in each class of sounds it is found that only a small number are ever realised. For example, the stop arrangement of /b d ɟ g/ is never found, for the only 4-stop position arrangement occurring in Australian languages is /b d dʲ g/.

The areal distributions of these distributional systems can also be examined, and it should be noted that areal congruence is as equally important as areal diversity, for both can suggest diachronic development and synchronic relations. Appendix 1 contains the areal distributions that correspond to the systemic arrangements, with Map 1 indicating the approximate positions of the languages studied.

## 1.0. CONSONANT PHONEMES

Table 1 is a listing of the consonants that have been recorded in the languages studied; the horizontal arrangement of positions of articulation reflects the preferred emphasis on the active articulator rather than the passive place of articulation (Dixon 1980:20). The vertical arrangement of manners of articulation represents the order of the analysis in the following sections.

TABLE 1: CONSONANT PHONEMES

	Apical		Laminal		Peripheral			Glottal
	Alveolar	Retroflex	Dental	Palatal	Bilabial	Velar	Palato- velar	
stops	d	ɖ	ɗ	dʲ	b	g	gʲ	ʔ
2nd series stops	t	ʈ	ʈ	tʲ	p	k		
Prenasalised stops	nd	ɳɖ	ɳɗ	nʲdʲ	mb	ŋg	ŋgʲ	
nasals	n	ɳ	ɳ	nʲ	m	ŋ	ŋʲ	
laterals	l	ɭ	ɭ	lʲ				
Prestopped nasals	ɲ	ɳ̥	ɳ̥	ɲʲ	ɱ	ŋ̥		
Prestopped laterals	ɻ	ɻ̥	ɻ̥	ɻʲ				
Prepalatalised	ɟd/ɟn ɟN/ɟl							
Rhotic release stops	dʳ	ɖʳ						
prenasals	ndʳ							
Labialised stops	dʷ	ɖʷ			bʷ	gʷ		
prenasals	ndʷ			nʲdʲʷ	mbʷ	ŋgʷ		
prestopped nasals					ɱʷ	ŋʷ		
laterals		ɭʷ						
Rhotics flap	r							
trill	ʀ							
Glided rhotics	ɹ	ʀ						
Glides			ɻ	ɻ	w/ɰ			
Fricatives	s/z		ʃ	ʒ	β	ɣ		

The tabular representation given is also indicative of the sound represented by the symbol employed with the following exceptions. The choice of the voiced symbols for the stop series and the voiceless for the second series stops does not necessarily represent the true nature of the distinction in any language. It is a device that reflects a marking phenomenon in Australian linguistics, for it is normal practice for single stop series languages to be represented by either set of symbols; some researchers prefer the voiced, others the voiceless. The voiced symbols are used throughout this analysis for languages with no contrast, voiceless symbols for when a contrast is present. In language names the presence of the voiceless symbol does not necessarily indicate the occurrence of a second stop series, but is rather the preference of the researcher concerned or an idiosyncrasy of mine. Some modifications to language names have been made for ease of orthographic representation.

The use of capital letters to represent phonemes is restricted to prestopping and rhotics, and is an orthographic device representing this phenomenon, discussed in 1.7. and 1.11. below.

It could be argued that those sounds represented by two symbols, like prenasalised stops, prepalatals and labialised consonants could perhaps be better treated as clusters. However, for the purpose of systematic analysis, author preference has been overlooked. Take for example, prenasalised stops. Burera has initial homorganic nasal and stop clusters which are treated as such (Glasgow and Glasgow 1962:10); Alawa is recorded as having prenasalised stops (Sharpe 1972:14). I have treated both languages in the same manner and record them as having prenasalised stops. However, in those languages where a researcher has not marked initial clusters as prenasalised stops I will indicate these by placing the word 'initial' in brackets after the language name.

Note that a question mark in brackets after a language name indicates uncertainty on the part of the researcher or myself. Also, the number and percentage figures that occur after each arrangement indicates the number of languages having this set of phonemes. The percentage is the proportion this group occupies out of the total number of languages sampled.

### 1.1. STOP CONSONANTS

We shall exclude the glottal stop from this section (see 1.2. below) and examine the arrangement patterns of the seven remaining stops. The following five arrangements are found, the distributions are set out below:

b d d<sup>v</sup> g  
 b d ɖ d<sup>v</sup> g  
 b d ɖ d<sup>v</sup> g  
 b d ɖ ɖ d<sup>v</sup> g  
 b d ɖ (ɖ) d<sup>v</sup> g j g

1.1.1. b d d<sup>v</sup> g (21 = 15.65%)

Guugu-Yalanji	Mabuiag	Lenngidigh
Gidabal	Mulurudji	Lama-lama
Gureng-gureng	Malag-malag	Waka-waka
Djaabugay	Ngarigu	Warungu
Dyirbal	Ngengomeri	Wargamay
Tiwi	Nganjaywana	Waalubal
Maranunggu	Nyangumarda	Yidiny

It should be noted that in the single laminal languages, namely 1.1.1. and 1.1.2., some authors prefer to use the dental symbol rather than the palatal. The reason appears to rest in the allophonic alternation of the two. In Tiwi, for example, /d<sup>v</sup>/ is found preceding /i/, /ɖ/ elsewhere (Osborne 1974:10). Obviously the dental occurs in more environments than the palatal and thus the preferred symbol is the dental. The other languages that have this preference for the dental symbol are Mabuiag, Lama-lama, Lenngidigh, and in 1.1.2., Madi-madi. Preference is given to uniformity and the laminal palatal symbol is used in languages with no laminal contrast. This type of phenomenon supports the diachronic evidence on the development of two laminals from one (Dixon 1970b:92).

The areal distribution of the 4-stop arrangement is found on Map 2, Appendix 1. This type occurs along the east coastal regions of Australia, Cape York and the Daly River region of the Northern Territory. Only one example, Nyangumarda, is found in Western Australia. It appears that the central region is devoid of this type. It should be noted that the areal distribution covers only those languages studied. Therefore the claim of non-appearance is not absolute, but rather a suggestion of the distribution pattern of a certain phenomenon. This caveat applies throughout the study.

1.1.2. b d ɖ d<sup>v</sup> g (29 = 21.64%)

Andagerinja	Bard	Gugada
Alawa	Pitjantjatjara	Djaru
Burera	Gugandji	Djeebana
Pungu-pungu	Garadjari	Mayali

Pintupi	Gunwinggu	Mantjiltjara
Madi-madi	NjungaR	Waɟaman
Mara	Rembarnga	Walmatjari
Maung	Wadyiginy	Waramunga
Ngarinjin	Walpiri	Wambaya
Ngarla	Yiwadja	

The double apical, single laminal languages are restricted to the western half of the continent. On Map 3 we see that Madi-madi is the only language that occurs east of the eastern Northern Territory-South Australian border.

1.1.3. b d ɟ dʲ g (33 = 24.63%)

Aridingidigh	Kuku-Thaypan	Ngangikurrungurr
Awngdim	Guugu-Yimidhirr	Ngiyamba
Umbila	Thaayore	Ndraʔangid
Umbuygamu	Dhurga	Ludigh
Brinken	Dharawal	Wikmunkan
Gugu-Badhun	Mbabaram	Wik-Ep
Kunjen	Mbeiwum	Wikmumin
Kurtjar	Mbalidjan	Yir-Yoront
Gog-Nar	Mpakwithi	Yathaikana
Koko-Bera	Mbara	Yinwum
Kuuku-Yaʔu	Nggod	Yuwaalaraay

In Guugu-Yimidhirr John Haviland (personal communication) reports the possibility of retroflex stops and nasals for he found the regular occurrence of initial retroflexes in a few cases. Initial occurrence is quite significant for it is in this position that the retroflex and alveolar distinction can be neutralised, as in the case of some Mara words for example (Busby 1978:3-4).

On Map 5 we find the areal distribution of the double laminal, single apical languages. They are predominantly restricted to the Cape York region, with two cases in the Daly River area: Brinken and Ngangikurrungurr. These are the only two examples west of the eastern north-south Northern Territory-South Australian borders.

1.1.4. b d ɟ dʲ g (47 = 35.07%)

Andiljaugwa	Kitja	Nunggubuyu
Andegeribina	Djamindjung	Lardil
Alyawarra	Djabu	Ritharngu
Arabana	Djambarrpuynngu	Warramiri

Aranda	Thargari	Wangurri
Bidyara	Dalabon	Wagilak
Pita-pita	Datiway	Wanggumara
Bailko	Diyari	Wangganguru
Kaititj	Malyangapa	Waḷuwara
Gubabuyngu	Murawari	Wemba-wemba
Kukatj	Mandelbingu	Yinytyiparnti
Galpu	Margany	Yanhangu
Gungabula	Murinbata	Yandruwandha
Kuthant	Ngawun	Yukulta
Kalkatungu	Ngaḷuma	Yaraldi
Kurama	Nanta	

Note that Dalabon may not have the dental series. O'Grady, Voegelin and Voegelin (1966:61) are uncertain of its status, whilst Capell (1962:93) lists them as phonemic. The distribution of this 6-stop arrangement, Map 4, is rather scattered, with only Cape York and the east coast being exempt. Gungabula and Bidyara in central Queensland and Murawari on the Queensland border are the most eastern occurrences, Yaraldi and Wemba-wemba are the most southern.

#### 1.1.5. b d ɖ (ɗ) dʲ gj g (4 = 2.99%)

Djingili	Garawa
Ngarndji	Yanyula

Of these four languages only Yanyula has the full seven stops, the other three lack the dental. We can see on Map 6 that these languages are restricted to a small area west of the southern end of the Gulf of Carpentaria. Djingili and Ngarndji are in the Djingili-Wambayan language family, whilst Yanyula and Garawa do not appear to be related despite their geographical closeness. Of all four, only Yanyula is a prefixing language (Wurm 1972:118-119). It is interesting to note that Gudandji, occurring between the two groups, is a double apical, single laminal language. Wambaya has the same system as Gudandji and occurs south of Djingili.

#### 1.2. GLOTTAL STOP

Capell remarked that the glottal stop is found "almost exclusively in Cape York Peninsula and Arnhem Land" (Capell 1967:91); with the exception of Nanta in Western Australia, this statement holds true. In the Arnhem Land languages the glottal stop may be considered a syllable prosody (Dixon, personal communication), although only a few researchers

have recorded it as such. In only Gunwinggu (Carroll 1976:15) and Rembarnga (McKay 1975b:14) we find this aspect mentioned.

### 1.2.1. Arnhem Land Languages

Gunwinggu	Djambarrpuynggu	Warramiri
Galpu	Djabu	Wangurri
Gubabuyngu	Mandelbingu	Wagilak
Datiway	Ritharngu	Yanhangu
Dalabon	Rembarnga	

### 1.2.2. Other Languages

Awngdim	Murinbata	Lenngidigh
Umbuygamu	Maung	Lama-lama
Umbila	Nggod	Wikmunkan
Kuuku-Ya'u	Ndra'angid	Wik-Ep
Thaayore	Nanta (?)	Yinwum
Mpakwithi	Ludigh	Yir-Yoront
Mayali		

The glottal stop occurs in only one word in Murinbata; /mu'mun/ 'water rat' (Walsh 1976:25). Map 7 shows the areal distribution where we see that the only exception to Capell's observation is Nanta on the West Australian coast. It is of importance to note that the source of the Nanta material was O'Grady, Voegelin and Voegelin (1966:61) and not the result of an in-depth study. Their material varies in quality. In Aranda, for instance, there is agreement with other researchers, whilst in others, like Brinken there are differences. Tryon recorded no retroflexes, no dental except the stop, no vowel length and the possible occurrence of schwa (Tryon 1974:71) in Brinken in comparison to the phonemic system given by O'Grady, Voegelin and Voegelin. In this instance I have used Tryon's material.

### 1.3. SECOND SERIES STOPS

In the analysis of languages under study there has been a natural division in double stop phonologies. The first of these was in Arnhem Land, the second was a more geographical diverse group. The same type of division can be found with glottal stop occurrences (see 1.2. above).

For those languages with a specification following, the label indicates the choice of the researcher.

## 1.3.1. Arnhem Land Languages

These languages appear to have a distinction only in certain environments and under some morphophonemic constraints. In Mayali, the distinction is found intervocally and after some sonorants (Merlan, personal communication); in Galpu the situation seems to be similar (Wood 1977:28).

Burera	Mayali (lenis/fortis)
Gubabuyngu (gem./non-gem.)	Ngangikurrungurr
Galpu	Rembarnga (gem./non-gem.)
Djambarrpuynggu	Ritharngu (lenis/fortis)
Djabu	Wangurri
Djeebana (gem./non-gem.)	Warramiri
Datiway	Wagilak
Mandelbingu	Yanhangu

Burera is included even though Glasgow and Glasgow (1962) dismiss the second series. Tryon reported them and states that their behaviour is similar to others in this group (Tryon 1974:231). Ngangikurrungurr is reported as having a double stop system on one hand (Courtenay 1976: n.p.), whilst on the other they have been dismissed for morphophonemic reasons (Tryon 1974:231). Tryon also remarked that the same phenomenon occurs in some of his Daly River languages, and these perhaps should be included in this language group. The predictability, however, of the second series of stops is still unclear in some of the languages within this Arnhem Land group.

## 1.3.2. Other Languages

Umbuygamu (voiced/voiceless)	Djamindjung (voiced/voiceless)
Kunjen (aspirate/non-aspirate)	Thargari (voiced/voiceless)
Diyari (voiced/voiceless)	Wikmumin (voiced/voiceless)
Murinbata (voiced/voiceless)	Wangumara (voiced/voiceless)
Margany (tense/lax)	Waramunga (gem./non-gem.)
Mbeiwum (voiced/voiceless)	Waɭuwara (voiced/voiceless)
Mabuɪag (voiced/voiceless)	Yandruwandha (voiced/voiceless)

In Diyari only two voiced stop phonemes occur, namely the apicals /d/ and /d̪/ (Austin 1978a:51). In the case of Djamindjung and Murinbata the situation is similar to Ngangikurrungurr in that these two languages lack the dentals /d̪/ and /n̪/. Because of this peculiarity, Walsh sets up /ɟ/ as a marginal phoneme in both cases (Walsh 1976:24 and personal communication). In Waramunga, Hale (1959c:1) reports that

C → [+gem] / V \_\_\_\_\_ However, we do find geminate nasals  
 [+stop]                  [+stress]



and laterals in his fieldnotes. It has also been reported that "all consonants except semi-vowels and the flap can be geminated" (Chakravarti 1976:7); thus the phonemic status of this phenomenon is unclear.

Finally, the occurrence of voiceless and voiced stops in Waḷuwara is in complementary distribution with vowel length (Breen 1971:24). For example, we find /pantu/ 'waist' and /pa:ndu/ 'butt of tree' (Dixon personal communication). I have followed Breen's analysis and specified the distinction as voiced/voiceless as opposed to vowel length.

It will be noticed that the five methods of distinction: (voiced/voiceless), (aspirate/non-aspirate), (tense/lax), (fortis/lenis) and (geminate/non-geminate) are not mutually exclusive. In Galpu, for instance, the distinction was reported to be fortis, voiceless, geminate/lenis, voiced, non-geminate (Wood 1977:28). The areal distribution of the second stop series is found on Map 8.

#### 1.4. PRENASALISED STOPS

As well as the previous comments on prenasalisation above (1.0.), I wish to make the further point that I am not making the claim that in Australian languages the syllable structure is such that in any word the initial consonant position will be filled by a unit phoneme alone. The use of the term prenasalised stop to describe initial clusters of a homorganic nasal and stop is a device to register similarity, thus recording the extent of initial clusters and prenasalised stops.

The occurrence of the word 'initial' in brackets indicates the recording of initial clusters which have not been described as prenasalised stops.

Alyawarra (?)	Mara
Alawa	Mpakwithi
Aridingidigh (initial)	Mbeiwum (initial)
Andegeribina	Mbalidjan
Burera (initial)	Ndraʔangid (initial)
Kalkatungu (initial)	Nggod (initial)
Kaititj (?)	Lama-lama
Kuku-Thaypan	Yanyula (initial)
Mbabaram (initial)	Yinwum
Mbara	

Both Alyawarra and Kaititj are included in this section because prenasalised stops do occur at the phonetic level. Their analysis at the phonemic level is, however, another problem (Koch, personal communication). In Kalkatungu there is only the recording of three initial

clusters, namely /mb/, /nd/ and /ŋg/ (Blake 1969:7). It should be noted that Jagst sets up a series of prenasalised stops in Walpiri because of one instance of initial /mb/ (Jagst 1975:21). However on the basis of other data (Dixon, personal communication) and because it is only one instance, a series of prenasalised stops shall not be included.

Map 9 shows the areal diversity of prenasalised stops. We find that Cape York has a large percentage and these languages are known as being some of the Initial Dropping Languages (Sutton 1976:102-124). These languages have the diachronic development of for instance, /bamba/ > /mba/ and thus we find synchronically, the initial homorganic nasal and stop cluster (Dixon 1980:4). Eastern Arnhem Land and Central Australia are the other areas where prenasalised stops are present.

### 1.5. NASALS

The most powerful generalization opposed by not a single exception, is that the number of linear distinctions made among oral stops in a given language is identical with the number of linear distinctions made among nasals.

(O'Grady, Voegelin and Voegelin 1966:57)

This complements Ferguson's universal claim that no language has more nasal positions than stop positions (Ferguson 1966:57).

Such a statement is fairly representative of the number of nasals in the majority of Australian languages. There are, however, a small group of languages which do not have a one-to-one correspondence of nasal and stop positions. The first type is found in Djingili and Ngarndji (C11 and 12 on Map 10) where the palato-velar nasal /ŋj/ is not present. It is interesting to note that the other two languages with the equivalent stop arrangement, Garawa and Yanyula, have the corresponding nasal.

The second type of unequal correspondence involves the laminal nasal. In double laminal stop languages the dental nasal is either sub-phonemic or absent. This is the case in the languages:

Djamindjung	Wemba-wemba
Murinbata	Awngdim (?)
Ngangikurrungurr	Brinken
	Gugu-Badhun

As mentioned previously (1.3.2.), Djamindjung and the following three languages also lack the voiced dental stop whilst the voiceless /t/ is present. In Gugu-Badhun the distinction between the laminal stops is phonemic, in nasals it is phonetic. Note that /n/ → [nʷ] / — /i/,

[n] elsewhere (Sutton 1973:78). This is the same environment for the laminal stop alternation in Tiwi (see 1.1.1. above).

In the single laminal stop languages we find only two cases where the laminal nasal is absent, Mabuiaq and Lama-lama in Cape York. Map 10 shows that the languages where the number of stops is greater than the number of nasals are restricted to Cape York and Arnhem Land; Wemba-wemba on the Murray River is the only exception.

It is important to note that all languages have the same number of apical stops as apical nasals. Peripheral stops and nasals are also in a one-to-one correspondence excepting the palato-velar nasal as specified above. It is in the laminals that we find the cases where the number of nasals and stops can be unequal.

### 1.6. LATERALS

Two points are worth noting in the discussion of the following position arrangements of laterals found in Australian languages. The first is directed at the type of analysis employed. Lateral position arrangements are discussed in terms of symmetry, where a one-to-one correspondence of laterals with non-peripheral stops is a symmetrical system. The non-symmetrical systems are listed according to stop arrangements. This gives us two sets of figures, discussed in 1.6.6. below.

The second point concerns the types of systems that do not occur. We do not find that the number of laterals is greater than the number of non-peripheral stops in any language. We also find that all languages with two laminal laterals also have two apical laterals. The single laminal lateral, single apical lateral type (1.6.2.) is small in number, suggesting that the laminal laterals are more phonologically complex. In nasals we saw that it was the laminal, or the laminal dental in double laminal stop languages, that may be subphonemic or absent. We may therefore suggest that laminals, especially the dental place of articulation, is more complex in the sense of an implied hierarchy of phonological complexity.

#### 1.6.1. | (51 = 38.06%)

Symmetrical: Ø

Non-symmetrical:

Stop type | (b d d<sup>v</sup> g)

Gugu-Yalanji	Tiwi	Wargamay
Gidabal	Mulurudji	Warungu
Gureng-gureng	Mabuiaq	Waalubal

Djaabugay	Maranunggu	Waka-waka
Dyirbal	Lenngidigh	Yidiny
	Lama-lama	

Stop Type 2 (b d ɖ dʲ g)  
Djeebana

Stop Type 3 (b d ɖ dʲ g)		
Awngdim	Kuku-Thaypan	Ngiyamba
Aridingidigh	Thaayore	Ndraʔangid
Umbila	Dhurga	Ludigh
Guugu-Yimidhirr	Dharawal	Wikmumin
Gugu-Badhun	Mbara	Wik-Ep
Koko-Bera	Mpakwithi	Wikmunkan
Kunjen	Mbalidjan	Yathaikana
Kurtjar	Mbeiwum	Yinwum
Gog-Nar	Mbabaram	Yuwaalaraay
Kuuku-Yaʔu	Ngangikurrungurr	Nggod

Stop Type 4 (b d ɖ ɗ dʲ g)  
Bidyara                      Lardil  
Gungabula                    Wemba-wemba

On Map 11 we see the areal distribution of the single lateral languages restricted to Cape York and the east coast of Australia. The most inland languages are Wemba-wemba and Yuwaalaraay. In Arnhem Land we find the four languages Tiwi, Ngangikurrungurr, Maranunggu and Djeebana.

#### 1.6.2. 1 1ʲ (9 = 6.72%)

This surprisingly is quite rare, occurring in only the following nine languages:

##### Symmetrical:

Stop Type 1 (b d dʲ g)		
Malag-malag	Nganjaywana	Ngarigu
Ngengomeri		Nyangumarda

##### Non-symmetrical:

Stop Type 2 (b d ɖ dʲ g)		
Yiwadja		
Stop Type 3 (b d ɖ dʲ g)		
Umbuygamu	Brinken	Yir-Yoront

There appears to be no areal congruence of this system. Map 12 shows us Nganjaywana in the east for instance and the Daly River languages in the north-west of Arnhem Land.

1.6.3. | | | (30 = 22.39%)

Symmetrical:

Stop Type 2 (b d ɖ dʷ g)

Alawa	Bard	Garadjari
Andagerinja	Pintupi	Gugada
Pitjantjatjara	Gugandji	Djaru
Madi-madi	Ngarinjin	Waramunga
Maung	Ngarla	Walmatjari
Mantjiltjara	NjungaR	Waɟaman
Mayali	Wambaya	Walpiri

Non-symmetrical:

Stop Type 4 (b d ɖ ɟ dʷ g)

Kitja	Murinbata	Malyangapa
Djamindjung	Margany	Nunggubuyu

Stop Type 5 (b d ɖ (ɟ) dʷ gɟ g)

Garawa	Djingili	Ngarndji
--------	----------	----------

Areally, we find that there are two cases east of the eastern Northern Territory-South Australian north-south border (Map 13). They are Margany and Madi-madi; the rest of the languages in this lateral arrangement are scattered over the western three-quarters of the continent.

1.6.4. | | | (26 = 19.14%)

Symmetrical: Ø

Non-symmetrical:

Stop Type 2 (b d ɖ dʷ g)

Pungu-pungu	Gunwinggu	Rembarnga
Burera	Mara	Wadyiginy

Stop Type 4 (b d ɖ ɟ dʷ g)

Gubabuyngu	Kurama	Datiway
Galpu	Djabu	Dalabon
Kukatj	Djambarrpuynggu	Mandelbingu
Kuthant	Thargari	Murawari
Ngawun	Wangurri	Yinytyiparnti
Ritharngu	Warramiri	Yanhangu
Wagilak		Yukulta

Murawari may have the laminal palatal lateral, the status however, is uncertain (Oates 1976:244). On Map 14 we notice that there is a concentration of languages in eastern Arnhem Land, in the western area the Daly River languages Pungu-pungu and Wadyiginy. In Western Australia we find a few cases, but none are found in the central region of the continent. To the south of the Gulf of Carpentaria we find a few languages, the most inland being Ngawun. The most eastern case appears to be Murawari on the Queensland-New South Wales border.

#### 1.6.5. | | | lʷ (18 = 13.43%)

##### Symmetrical:

Stop Type 4 (b d ɖ ɗ dʷ g)

Andegeribina	Pita-pita	Nanta
Aranda	Kalkatungu	Waɭuwara
Alyawarra	Kaititj	Wanggumara
Arabana	Diyari	Wangganguru
Andiljaugwa	Ngalauma	Yaraldi
Bailko		Yandruwandha

Stop Type 5 (b d ɖ (ɗ) dʷ gj g)

Yanyula

##### Non-symmetrical: Ø

Map 15 shows that the 4-lateral type is found predominantly in central Australia. Yaraldi on the mouth of the Murray River is the most southern language. Yanyula and Andiljaugwa in Arnhem Land and a few cases in Western Australia are the only other cases outside this central region.

#### 1.6.6. Stop and Lateral Distributions

Table 2 shows the percentages of membership to each combination. The zero components (those shown as Ø) are predictable in most cases for there cannot be a lateral which has no corresponding stop phoneme. Therefore type 1 stop system cannot occur with types 3-5 lateral systems. A type 3 stop system is a single apical and is thus excluded from lateral system types 3-5. Type 5 stop system includes only four languages so we would expect gaps in its lateral series membership. However we find the null set for type 4 stop system and type 2 lateral system. In other words, we find no instances of the stop and lateral combination of:

b	d	ɖ	ɗ	dʷ	g
				ʷ	

TABLE 2: PERCENTAGES OF STOP AND LATERAL DISTRIBUTIONS

2.1. Lateral group by % of  $\frac{\Sigma \text{ in each stop group}}{\text{Total } \Sigma \text{ of stops in each lateral group}}$

lateral group	stop group					$\Sigma$
	1	2	3	4	5	
1	31.37	1.96	58.83	7.84	$\emptyset$	100.00
2	55.56	11.11	33.33	$\emptyset$	$\emptyset$	100.00
3	$\emptyset$	70.00	$\emptyset$	20.00	10.00	100.00
4	$\emptyset$	23.08	$\emptyset$	76.92	$\emptyset$	100.00
5	$\emptyset$	$\emptyset$	$\emptyset$	94.44	5.56	100.00

2.2. Lateral group by % of  $\frac{\Sigma \text{ of each stop type in lateral group}}{\text{Total } \Sigma \text{ of stops in each stop group}}$

stop group	lateral group					$\Sigma$
	1	2	3	4	5	
1	76.19	23.81	$\emptyset$	$\emptyset$	$\emptyset$	100.00
2	3.45	3.45	72.41	20.69	$\emptyset$	100.00
3	90.91	9.09	$\emptyset$	$\emptyset$	$\emptyset$	100.00
4	8.51	$\emptyset$	12.77	42.55	36.17	100.00
5	$\emptyset$	$\emptyset$	75.00	$\emptyset$	25.00	100.00

It is worth noting the following more common combinations from both tables:

stop type 3 and lateral type 1 b d  $\text{d}^{\vee}$  g  
l

stop type 4 and lateral type 4 b d  $\text{d}^{\vee}$   $\text{d}^{\vee}$   $\text{d}^{\vee}$  g  
l l

stop type 1 and lateral type 2 b d  $\text{d}^{\vee}$  g  
l l $^{\vee}$

stop type 2 and lateral type 3 b d  $\text{d}^{\vee}$   $\text{d}^{\vee}$  g  
l l l $^{\vee}$

On the other hand, unlikely combinations are as equally relevant, for example:

stop type 2 and lateral type 1	b	d	ɖ	dʲ	g	
stop type 4 and lateral type 1	b	d	ɖ	ɖ	dʲ	g
stop type 4 and lateral type 3	b	d	ɖ	ɖ	dʲ	g

### 1.7. PRESTOPPING

This section concerns prestopped nasals and laterals. It is felt that in terms of distribution, it is better to regard this phenomenon as prestopping rather than "stops with nasal release" (O'Grady, Voegelin and Voegelin 1966:59) and laterally released stops. Phonotactically, prestopped nasals for instance have the same distribution as nasals in Kaititj (Koch, personal communication), and sometimes alternate with long nasals in both Kaititj and Alyawarra (Yallop 1977: 12).

Prestopped nasals occur in the following languages:

Aranda	Arabana	Kaititj
Alyawarra	Kunjen	Wangganguru

Arabana and Wangganguru lack the retroflex and velar prestopped nasal, the other languages have six except Kunjen with five, for the retroflex is absent in this case.

Prestopped laterals are found in Yandruwandha, Arabana and Wangganguru. Again, the last two do not have a full set of four, the retroflex is absent.

It should be noted that the number of prestopped nasals does not exceed the number of nasals and likewise for laterals. Excepting Kunjen, all the languages have six nasals and four laterals. Yandruwandha is the only language that has prestopped laterals but no prestopped nasals.

Map 16 shows that Kunjen in western Cape York is the only language distant from the rest in the central region of Australia; otherwise this phenomenon is an areal feature.

### 1.8. PREPALATALISATION

In Andegeribina we find the only case of phonemic prepalatalisation in the data surveyed. This is a device employed to allow for a



morphophonemic two vowel system of a/a: (Breen 1977a:384). Andegeribina is found in Central Australia, C6 on Map 16.

### 1.9. RHOTIC RELEASE

The rhotic release of apical stops and the alveolar prestopped nasal appears to be a different phenomenon from the prestopping of certain stops before rhotics. In Mpakwithi for instance, rhotic released stops function phonotactically as stops and not as rhotics (Crowley, personal communication).

/d<sup>r</sup>/ is found in:

Awngdim	Ndra'angid	Yinwum
Aridingidigh	Nggod	Yandruwandha
Mpakwithi	Lenngidigh	

/nd<sup>r</sup>/ is found in:

Mpakwithi	Ndra'angid	Yinwum
-----------	------------	--------

/ḍ<sup>r</sup>/ is found in:

Yandruwandha

Breen regards the rhotic released stops in Yandruwandha as prestopped trills (Breen 1976c:597), presumably on the basis of phonological similarity with prestopped laterals. However, there is no evidence as to the phonotactic function of the rhotic released stops in Yandruwandha, whether or not they function in the same manner as stops or rhotics. It is thus felt that they are best described as rhotic released stops as opposed to prestopped trills for we notice that /d<sup>r</sup>/ occurs elsewhere and functions phonotactically as a stop. It is also somewhat discordant to describe /ḍ<sup>r</sup>/ as a retroflex prestopped trill as opposed to a rhotic released retroflex stop.

Areal occurrence of the rhotic released stop is in Cape York, with Yandruwandha in Central Australia the only exception; see Map 17.

### 1.10. LABIALISATION

Labialisation is a phonotactic or prosodic device employed to describe the rounding of certain consonants in a manner similar to the phonological constructions of the preceding three sections. The languages and their respective labialised consonants are:

Andiljaugwa: g<sup>w</sup> ŋ<sup>w</sup>

Mbabaram (?): g<sup>w</sup> (ŋ<sup>w</sup>) d<sup>w</sup> n<sup>w</sup>

Andegeribina: mb<sup>w</sup> ŋg<sup>w</sup> b<sup>w</sup> g<sup>w</sup> m<sup>w</sup> ŋ<sup>w</sup> M<sup>w</sup> ŋ<sup>w</sup>

Tiwi: unknown (Breen 1977b)

Alyawarra: b<sup>w</sup> d<sup>w</sup> ɟ<sup>w</sup> g<sup>w</sup> ŋ<sup>w</sup> !<sup>w</sup> (?)

It is important to note that Alyawarra and the other Arandic languages in this study (Aranda and Kaititj) do have phonetic rounding on some consonants, their status being a matter of morphophonemic arrangement (Koch, personal communication). The Alyawarra data above is taken as being phonemic by its researcher (Turtle 1977:6). Yallop, on the other hand, recorded in Alyawarra the following consonants as being the first member of a cluster where the second was /w/: b, d, g, M, N, m, ŋ, n, mb, nd, nʋdʋ (Yallop 1977:43).

Geographically, on Map 18 we see the Central Australian languages, Mbabaram in Cape York, Andiljaugwa on Groote Island and Tiwi on Melville and Bathurst Islands.

### 1.11. RHOTICS

In Australian languages four rhotics have been recorded; the flap, trill and two glided rhotics, the retroflex and alveolar. The majority of languages, 80.60%, have two rhotics, the retroflex continuant /R/ and the flap or trill /r/. I prefer to use /R/ and not /ɾ/ (cf. Dixon 1972) for orthographic ease; it does not imply a uvula trill as its IPA value might indicate. IPA /ɻ/ is conventionally not used in describing Australian languages and is reserved here for the alveolar glided rhotic in Murinbata (1.11.5. below). It is of importance to note that /r/ in this case usually has both flap and trill allophones. In those languages where the trill and flap are in phonemic contrast, the flap is marked as /r/ and the trill as /ɾ̄/.

In the remaining four types of arrangement we notice that we do not find the flap and trill without the retroflex continuant but do find just a flap or trill without the continuant. We also find only one doubtful case of the continuant rhotic /R/ as the only rhotic present in the phonology of a language. One language contrasts the two glided rhotics with the trill or flap.

#### 1.11.1. R r (continuant, trill/flap) (108 = 80.60%)

Aridingidigh	Bard	Gugada
Awngdim	Pitjantjatjara	Koko-Bera
Andagerinja	Brinken	Gunwinggu
Alawa	Kaititj	Guugu-Yalanji
Andiljaugwa	Galpu	Kitja
Alyawarra	Garadjari	Djamindjung

Aranda	Kurama	Djeebana
Andegeribina	Gudandji	Dyirbal
Arabana	Kalkatungu	Djabu
Umbila	Kunjen	Djaabugay
Umbuygamu	Gungabula	Djambarrpuynggu
Burera	Gugu-Badhun	Djingili
Pungu-pungu	Gubabuyngu	Djaru
Pintupi	Guugu-Yimidhirr	Thaayore
Bidyara	Garawa	Tiwi
Bailko	Kuku-Thaypan	Datiway
Mbabaram	Ngarinjin	Waɟaman
Mandelbingu	Ngawun	Warungu
Maranunggu	Ngangikurrungurr	Waluwara
Mbara	NyungaR	Wemba-wemba
Mbeiwum	Nyangumarda	Wargamay
Mantjiltjara	Ndra'angid	Walmartjari
Mayali	Nanta	Waramunga
Mara	Nunggubuyu	Wambaya
Maung	Lenngidigh	Wiknumin
Mpakwithi	Lardil	Yathaikana
Murawari	Rembarnga	Yanhangu
Malag-malag	Ritharngu	Yir-Yoront
Margany	Wadyiginy	Yukulta
Ngarndji	Wangganguru	Yaraldi
Ngarla	Warramiri	Yinwum
Nganjaywana	Wangurri	Yiwadja
Ngengomeri	Wagilak	Yanyula
Nggod	Wikmunkan	Yidiny
Ngiyamba	Waka-waka	Yinytyiparnti
Mulurudji	Wik-Ep	Yuwaalaraay

Both Murawari (Oates 1976:244) and Yiwadja (O'Grady, Voegelin and Voegelin 1966:62 and Capell 1962:129) may have the three rhotic system of /R r ʀ/.

#### 1.11.2. r (trill/flap) (11 = 8.21%)

Gureng-gureng	Dhurga	Ngarigu
Gidabal	Madi-madi	Ludigh
Kuuku-Ya'u	Mabuiag	Waalubal
Dharawal	Mbalidjan	

Map 19 shows that the areal distribution of this system is restricted to the east coast of Australia. The most western language appears to be Madi-madi.

1.11.3. R r ʀ (continuant, flap, trill) (13 = 9.70%)

Pita-pita	Dalabon	Lama-lama
Gog-Nar	Diyari	Walpiri
Kurtjar	Malyangapa	Wanggumara
Kuthant	Ngaḷuma	Yandruwandha
Kukatj		

A fairly widespread areal distribution is found (Map 20) with Lama-lama in Cape York the most eastern language. Otherwise, predominance in the Gulf region and northern South Australia account for most, with Ngaḷuma the most western language in this survey.

1.11.4. R (continuant) (1 = 0.75%)

The single glided rhotic is found in one language, Thargari in Western Australia (see Map 21). It has been recorded that [r] is an allophone of /t/, for Klokeid lists /r/ with the stops in his phonemic arrangement and states: "/r/ has voiced flap and trill allophones which are in free variation in most environments with the voiceless stop allophones, and are in fact more frequently occurring" (Klokeid 1969:3). Austin (personal communication) has suggested that there may be two phonemes /t/ and /r/, but he is unsure of their status.

Due to this being the only example of a language with a retroflex glided rhotic and since the researchers seem to disagree, the status and validity of this rhotic system is in doubt.

1.11.5. r R ʀ (trill/flap, retroflex and alveolar continuants)  
(1 = 0.75%)

On Map 20 we notice that the only language with this system, Murinbata, is located in the Port Keats region of the Northern Territory. We may be tempted to dismiss this system on the grounds that it occurs in only one language but it should be noted that its occurrence is well documented (Walsh 1976). In fact, even the language name contains the alveolar glided rhotic, "muɹinyɹata" (Walsh 1976). The neighbouring languages, Djamindjung and Ngangkurrungurr, which share many common features such as stop and nasal distributions, do not have these three rhotics. They have the more frequent system of two rhotics, /R/ and /r/.

## 1.12. GLIDES

Nearly all languages have two glides /w/ and /y/ (129 = 96.27%), with some languages having three.

## 1.12.1. y ɣ w (2 = 1.49%)

The extra glide is an interdental, occurring in only two languages in Western Australia, Kurama and Yinytyiparnti (Map 22), of which not much detail is available. It has been suggested that the diachronic development of /ɣ/ has been: /ɭ/ > /ɣ̣/ and /ɣ̣/ > /ɣ/ (Wordick, personal communication). This glide is apparently produced with the sides of the tongue against the cheek, the tongue is held flat and the tip is under the bottom teeth (Wordick, personal communication).

## 1.12.2. w ɰ y (3 = 2.24%)

Unrounded /w/, transcribed /ɰ/ (IPA /w̥/) occurs in Kaititj, Wik-Ep and Waluḡara (see Map 22). In Kaititj it has developed from the velar fricative, and in some instances is produced with some friction or allophonically alternates with the velar fricative (Koch, personal communication).

## 1.13. FRICATIVES

Fricatives are found in Arnhem Land, Cape York and Central Australia. Map 23 shows the areal distribution and we note that Thargari in Western Australia is the only language outside this area.

I have attempted to standardise symbols employed by various researchers. There is no need, for instance, to distinguish voiced and voiceless fricatives in any languages except Mabuḡag. To use symbols denoting such a difference may be phonetically accurate but phonemically irrelevant. The voiced symbols will be used in the same manner as was employed in the stop analysis (see 1.1.). We find the following types:

## 1.13.1. ɣ (6 = 21.43% of languages with fricatives, = 4.48% of the total number of languages)

Aranda	Kuthant	Maung (?)
Alyawarra	Tiwi	Yiwadja (?)

## 1.13.2. ɟ ð β (14 = 50.00% of languages with fricatives, = 10.45% of the total number of languages)

Aridingidigh	Kuku-Thaypan	Ludigh
Awngdim	Mbeiwum	Lenngidigh

Umbugamu	Mbalidjan	Yinwum
Kunjen	Nggod	Yathaikana
Kurtjar	Ndraʔangid	

- 1.13.3.  $\gamma \beta$  (1 = 3.57% of languages with fricatives, = 0.75% of the total number of languages)

Gog-Nar

- 1.13.4.  $\delta$  (2 = 7.14% of languages with fricatives, = 1.49% of the total number of languages)

Thargari

Mbara (?)

- 1.13.5.  $z \beta$  (1 = 3.57% of languages with fricatives, = 0.75% of the total number of languages)

Ngengomeri (?)

- 1.13.6.  $s z$  (1 = 3.57% of languages with fricatives, = 0.75% of the total number of languages)

Mabuiag, which is the only language in this survey with a voiced/voiceless distinction in fricatives.

- 1.13.7.  $\gamma z \beta$  (1 = 3.57% of languages with fricatives, = 0.75% of the total number of languages)

Lama-lama

- 1.13.8.  $z \zeta \beta$  (1 = 3.57% of languages with fricatives, = 0.75% of the total number of languages)

Ngangikurrungurr

- 1.13.9.  $\gamma \zeta \delta \beta$  (1 = 3.57% of languages with fricatives, = 0.75% of the total number of languages)

Mpakwithi, which has the largest number of fricatives in any one language.

In general, fricatives are uncommon phonemes, found in only 28 languages (20.90%) in this study. The absence or relative scarcity of fricatives is a major Australian areal characteristic.

## 2.0. VOWEL PHONEMES

TABLE 3: VOWEL PHONEMES

	Front		Central		Back
	-rnd	+rnd	-rnd	+rnd	+rnd
close	i	ü	ɨ	ɥ	u
half-close	e	ö	ə		o
half-open	æ				ɔ
open			a		

Diphthongs: ua, ɨa(:), ui, ai, ia(:)  
 Nasalised vowels: ɨ̃, ẽ, ã, ã̃  
 Length is distinct for the following vowels.  
 The bracketed forms are of uncertain status

i	(ü)	(ɨ)	(ɥ)	u
e	(ö)		(ə)	o
æ			a	

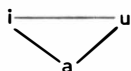
The vowel phonemes of Australian aboriginal languages, found in Table 3, have the same characteristics of the distribution that was found for consonants. Both vowels and consonants in the majority of languages fit into a small set of distributional combinations, with just a small number of aberrant languages. For example, the vowel system /i a u/ is found in 53.73% of all languages, irrespective of a length distinction. We can divide the vowel arrangements into three major types in order to examine their distributions:

2.1. Symmetrical systems, where there is symmetry both in the structure of the vowel diagram and in the presence and absence of a length distinction.

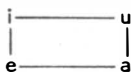
2.2. Semi-symmetrical systems, where there is some form of symmetry or similarity present.

2.3. Ungrouped systems; this being a collection of languages which do not fit into the above two types. It should be noted that vowel systems falling into this group are of the more aberrant types, where one system is usually unique to one language. The exception is the system /i u a a:/ which has three members.

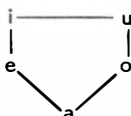
## 2.1. SYMMETRICAL SYSTEMS



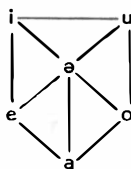
2.1.1.1. i a u

2.1.1.2. i a u ( $\pm$  length)

2.1.2.1. i e a u

2.1.2.2. i e a u ( $\pm$  length)

2.1.3.1. i e a o u

2.1.3.2. i e a o u ( $\pm$  length)

2.1.4.1. i e a o u ə

2.1.4.2. i e a o u ə ( $\pm$  length)

## 2.1.1. i a u

Map 24 shows the distribution of the vowel system /i a u/ without regard for the length distinction. There appears to be no areal congruency.

## 2.1.1.1. i a u (23 = 17.16%)

Pita-Pita	Dyirbal	Waluwara
Bidyara	Tiwi	Wambaya
Garawa	Diyari	Warungu
Gugu-Badhun	Mara	Wanggumara
Kunjen	Ngawun	Yanyula
Gungabula	Nganjaywana	Yaraldi
Guugu-Yalanji	Ngarla	Yandruwandha
Garadjari	Wiknumin	

In Waluwara a length distinction is not recorded because of its complementary distribution with the occurrence of a second series of stops (see 1.3.2.).

2.1.1.2. i a u ( $\pm$  length) (49 = 36.75%)

Alyawarra	Djeebana	Ngarigu
Aranda	Djabu	Nyangumarda
Arabana	Djingili	Nanta



Andagerinja	Djambarrpuynngu	Ritharngu
Umbila	Djaabugay	Waramunga
Pitjantjatjara	Thargari	Walmatjari
Bailko	Dharawal	Wargamay
Pintupi	Dhurga	Wagilak
Guugu-Yimidhirr	Datiway	Wangurri
Kuuku-Ya'u	Murawari	Warramiri
Gubabuyngu	Mulurudji	Wangganguru
Kurama	Mantjiltjara	Walpiri
Kalkatungu	Malyangapa	Yukulka
Gugada	Margany	Yanhangu
Galpu	Mandelbingu	Yidiny
Kukatj	Ngiyamba	Yuwaalaraay
	Ngaḷuma	

Both Bailko and Mulurudji (O'Grady, Voegelin and Voegelin 1966:85 and 67) may not have a length distinction. Similarly, Waramunga (Hale 1959c: n.p.; Chakravarti 1967:6; Capell 1953:298) may not distinguish length at the phonemic level. In Kukatj, a schwa may be present (Breen 1976c:154); whilst in Ritharngu (Heath 1978:34) and Yidiny (Dixon 1977:2-3) length occurs, for the former, on the first syllable only; and for the latter, it is only found on non-initial syllables.

#### 2.1.2. i e a u

Map 25 shows the areal distribution of this system. It appears that there are no cases in Central and Western Australia. We find cases in Cape York and the east coast, Madi-madi in the south and a few instances in western Arnhem Land.

##### 2.1.2.1. i e a u (8 = 5.97%)

Alawa	Madi-madi	Ndra'angid
Djamindjung	Ngangkurrungurr	Yinwum
Murinbata	Ngengomeri	

In Djamindjung, the status of /e/ is uncertain (Walsh, personal communication).

##### 2.1.2.2. i e a u (± length) (5 = 3.73%)

Gidabal	Lardil	Waalubal
Gureng-gureng		Yathaikana

In the case of Waalubal, Crowley remarks that the length of the vowel /e/ is predictable by rule (Crowley 1978:6-21). However, for symmetry

and for areal congruence, an /e:/ is included as part of the phoneme inventory.

### 2.1.3. i e a o u

Map 26 shows the sporadic occurrences of this vowel arrangement. One example is found in the south-west, NgungaR; but none are found south of the Queensland-New South Wales border.

#### 2.1.3.1. i e a o u (7 = 5.22%)

Burera	Mayali	Waɖaman
Gunwinggu	Ngarinjin	Yiwadja
	NjungaR	

Burera is reported as having word stress like English 'import/im'port (Glasgow and Glasgow 1962:2 and Glasgow 1966:n.p.). This is the only language where stress is reported at the phonemic level.

#### 2.1.3.2. i e a o u (± length) (5 = 3.73%)

Thaayore	Maung	Waka-waka
Mbara		Wikmunkan

### 2.1.4. i e a o u ə

The six vowel system has a restricted areal distribution (Map 27). Cases are found in Cape York and Arnhem Land, with Wemba-wemba being the only language outside this area.

#### 2.1.4.1. i e a o u ə (5 = 3.73%)

Koko-Bera	Rembarnga	Wemba-wemba
Lama-lama		Yir-Yoront

Note that vowel length in Wemba-wemba is possibly predictable by rule (Hercus 1969:28).

#### 2.1.4.2. i e a o u ə (± length) (2 = 1.49%)

Dalabon
Mabuiag

In the case of Mabuiag, vowel length does not occur on schwa (Klokeid 1971:19).

## 2.2. SEMI-SYMMETRICAL SYSTEMS

Map 28 shows the position of the /i a o u/ vowel system: both languages are in Western Australia. The distribution of /i e a u ə/ can be found on Map 29, an area restricted to the Daly River region and only one case in Cape York, Awngdim.

It is of interest to note that there are more cases of /i e a u/ than of /i a o u/; disregarding length and schwa. Nineteen cases are found of the former and only two of the latter in this survey. The following is a list of vowel systems and their language members:

i a u (± length) o (l = 0.75%)

Bard

i a u (± length) o: (l = 0.75%)

Yinytyiparnti

i e a u ə (6 = 4.48%)

Awngdim

Pungu-pungu

Maranunggu

Brinken

Malag-malag

Wadyiginy

The status of schwa in Brinken is uncertain (Tryon 1974:71).

i e a u ÷ (l = 0.75%)

Andiljaugwa

The occurrence of /÷/ has only been suggested in one source, namely Dixon (personal communication).

i e a o u ə ö (l = 0.75%)

Gog-Nar

i æ a u (2 = 1.49%)

Note that it appears that /æ/ is not a notational variant of /e/, for the former is apparently common in Northern Paman languages (Hale 1976a:7-40).

Ludigh

Mbalidjan

i æ a o u (l = 0.75%)

Lenngidigh

## 2.3. UNGROUPED SYSTEMS

i u a a: (3 = 2.27%)

Ngarndji

Nunggubuyu

Djaru

i + u a a: (1 = 0.75%)

Kitja

i e a o u + ə (± length) (?) (1 = 0.75%)

Mbabaram

This language, like Kuku-Thaypan in the next arrangement, can be seen as symmetrical on a vowel diagram.

i e æ a ɔ o u + (?) (1 = 0.75%)

Kuku-Thaypan

i u ə æ a (1 = 0.75%)

Aridingidigh

i ü u e o a (1 = 0.75%)

Mbeiwum

i u e ö o æ a (1 = 0.75%)

Nggod

i e a o u ü ö (+) (ə) (± length) (?) (1 = 0.75%)

Wik-Ep

i ö u a +a ia (± length) + (1 = 0.75%)

Note that diphthongs may be notational variants of Vowel + Glide or Glide + Vowel. However the notations used by the researchers have been followed here.

Kuthant

e ö o a +a (± length) (1 = 0.75%)

Kurtjar

i a u ua (1 = 0.75%)

Umbuygamu

i a u ui ai (1 = 0.75%)

Gugandji

2 vowel systems (2 = 1.49%)

Andegeribina a a:

Kaititj e a

Finally, the largest vowel system, Mpakwithi

i(:) ɪ ü u(:)  
 e(:) ě (ö) o  
 æ(:) ǣ  
 a(:) ǻ

## 2.4. RESIDUE AREAL DISTRIBUTIONS

### 2.4.1. Vowel Systems

Map 30 provides us with the occurrence of all languages which have not yet been geographically positioned, excepting the two vowel systems in Kaititj and Andegeribina. They include all of 2.3. and 2.2. except /i e a u ə/ and /i a o u/, the former being found on Map 29, the latter on Map 28. It is of interest to note that these languages are restricted to the northern quarter of the continent, with Cape York having the greatest density.

Map 31 indicates the occurrences of diphthongs, nasalised vowels and the two vowel systems.

### 2.4.2. Length Distinction

The distinction between long and short vowels is evenly distributed across the whole continent, easily verified by an examination of Maps 32 and 33. Length is found to be distinctive in 73 cases which is 54.48% of the total number of 134 languages in this study.

## 3.0. CONCLUSION

Certain regularities in the distribution of phonemes are noticeable from this analysis of the phonological systems of Australian aboriginal languages. For instance, every system studied has at least four positions of articulation for stops and nasals, where there is usually a one-to-one correspondence of positions of articulation between these two manners of production. Every language has at least one lateral, one rhotic, although the norm is two, and usually two glides. Vowel systems are dominated by /i a u/, but other systems are not so uncommon.

In the analysis of areal distributions it was noticed that the eastern Northern Territory-South Australian north-south border plays an important role in the distributions of the stop system /b d ɖ dʋ g/ (1.1.2.) and the lateral system /l ɭ ɮʋ/ (1.6.3.). The Cape York region and the east coast of the continent are predominant in the distribution of stop systems 1.1.1. (/b ɖ dʋ g/), 1.1.3. (/b d ɖ dʋ g/); the single

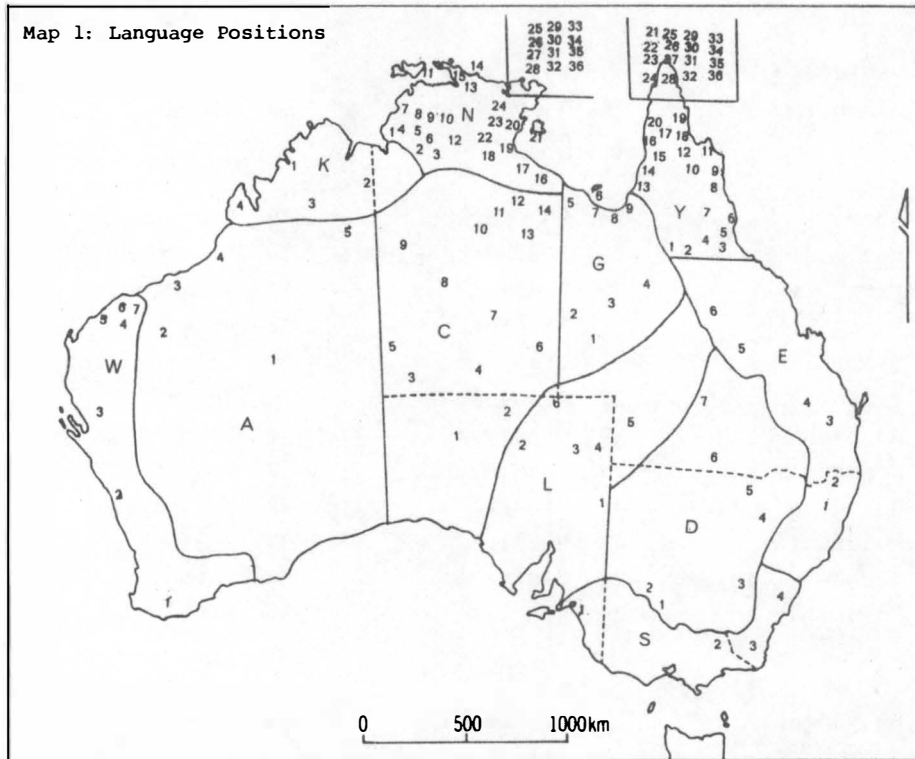
lateral system /l/ (1.6.1.); and the occurrence of the single rhotic /r/ (1.11.2.).

Cape York and Arnhem Land are significant areas in a number of distributions. The former has a large concentration of rhotic release stops (1.9.), fricatives (1.13.) and ungrouped vowels (Map 30). The latter is important in the distribution of the second stop series (1.3.), the lateral type /l̥/ (1.6.4.); whilst both have a high incidence of the glottal stop.

THE DISTRIBUTION OF PHONEMES IN AUSTRALIAN ABORIGINAL LANGUAGES

APPENDIX 1

Areal Distribution of Phonemic Systems



Map 1 above gives the approximate locations of the languages studied. I have used the same area coding as the A.I.A.S. Tribal Bibliography. The languages and their respective numbers are as follows. Note that this numbering system is the same throughout the areal distribution maps of Appendix 1.

## AREA S

1 Yaraldi	3 Dhurga	4 Dharawal
2 Ngarigu		

## AREA D

1 Wemba-wemba	4 Nganjaywana	6 Murawari
2 Madi-madi	5 Yuwaalaraay	7 Margany
3 Ngiyamba		

## AREA E

1 Waalubal	3 Waka-waka	5 Gungabula
2 Gidabal	4 Gureng-gureng	6 Bidyara

## AREA Y

1 Mbara	13 Gog-Nar	25 Ludigh
2 Warungu	14 Koko-Bera	26 Wikmumin
3 Wargamay	15 Kunjen	27 Ndra'angid
4 Gugu-Badhun	16 Yir-Yoront	28 Awngdim
5 Dyrbal	17 Thaayore	29 Aridingidigh
6 Yidiny	18 Lama-lama	30 Nggod
7 Mbabaram	19 Umbuygamu	31 Lenngidigh
8 Djaabugay	20 Wikmunkan	32 Mpakwithi
9 Guugu-Yalanji	21 Wik-Ep	33 Mbalidjan
10 Mulurudji	22 Umbila	34 Mbeiwum
11 Guugu-Yimidhirr	23 Yinwum	35 Yathaikana
12 Kuku-Thaypan	24 Kuuku-Ya'u	26 Mabuag

## AREA L

1 Malyangapa	3 Diyari	5 Wanggumara
2 Arabana	4 Yandruwandha	6 Wangganguru

## AREA K

1 Ngarinjin	3 Djaru	4 Bard
2 Kitja		



## AREA N

1	Murinbata	13	Gunwinggu	25	Ritharngu
2	Djamindjung	14	Maung	26	Burera
3	Waḍaman	15	Yiwadja	27	Djeebana
4	Ngangikurrungurr	16	Garawa	28	Yanhangu
5	Maranunggu	17	Yanyula	29	Djambarrpuynggu
6	Ngengomeri	18	Alawa	30	Gubabuyngu
7	Brinken	19	Mara	31	Wangurri
8	Wadyiginy	20	Nunggubuyu	32	Warramiri
9	Pungu-pungu	21	Andiljaugwa	33	Djabu
10	Malag-malag	22	Dalabon	34	Galpu
11	Tiwi	23	Rembarnga	35	Datiway
12	Mayali	24	Wagilak	36	Mandelbingu

## AREA A

1	Mantjiltjara	3	Nyangumarda	5	Walmatjari
2	Bailko	4	Garadjari		

## AREA C

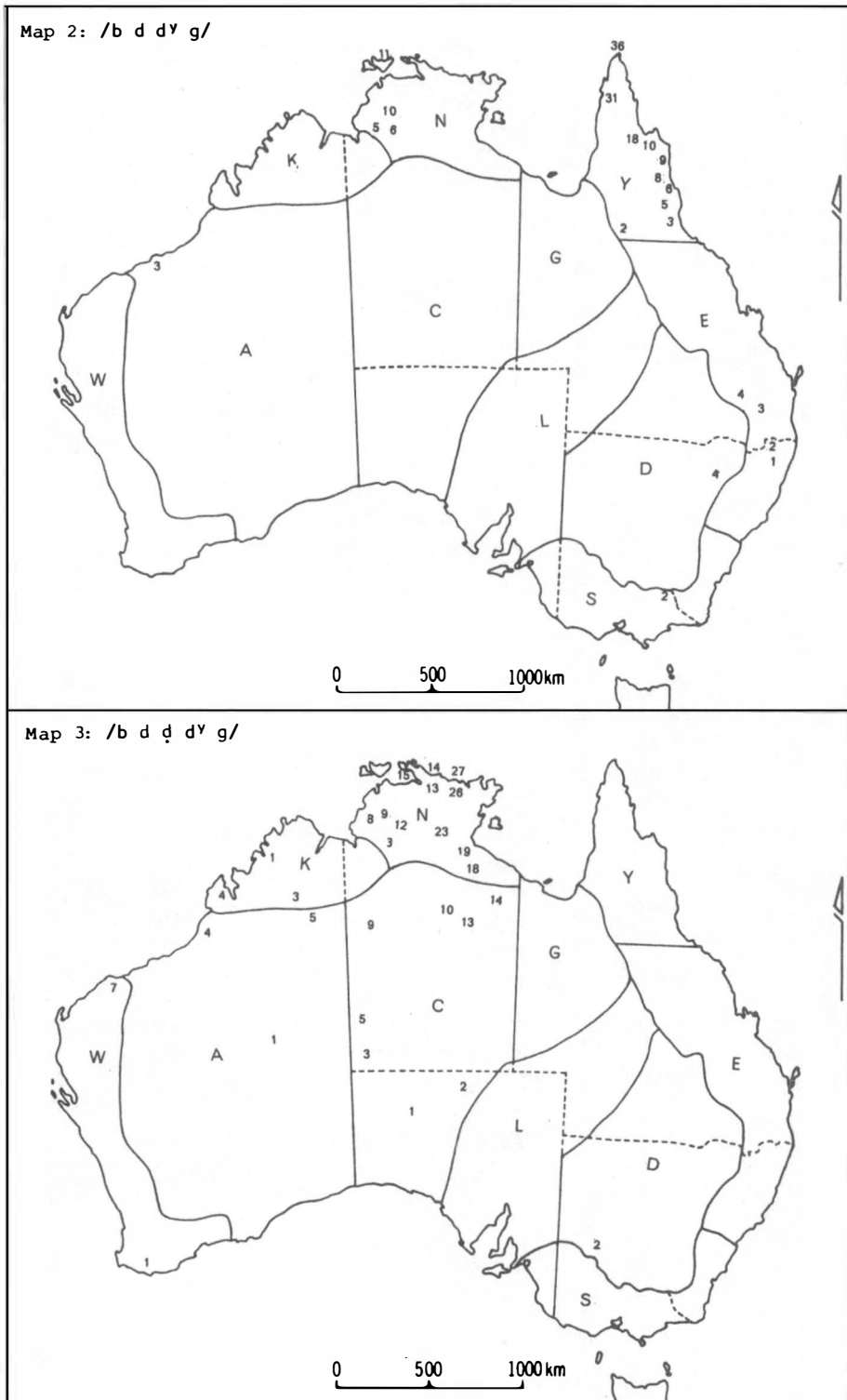
1	Gugada	6	Andegeribina	11	Djingili
2	Andagerinja	7	Alyawarra	12	Ngarndji
3	Pitjantjatjara	8	Kaititj	13	Wambaya
4	Aranda	9	Walpiri	14	Gudandji
5	Pintupi	10	Waramunga		

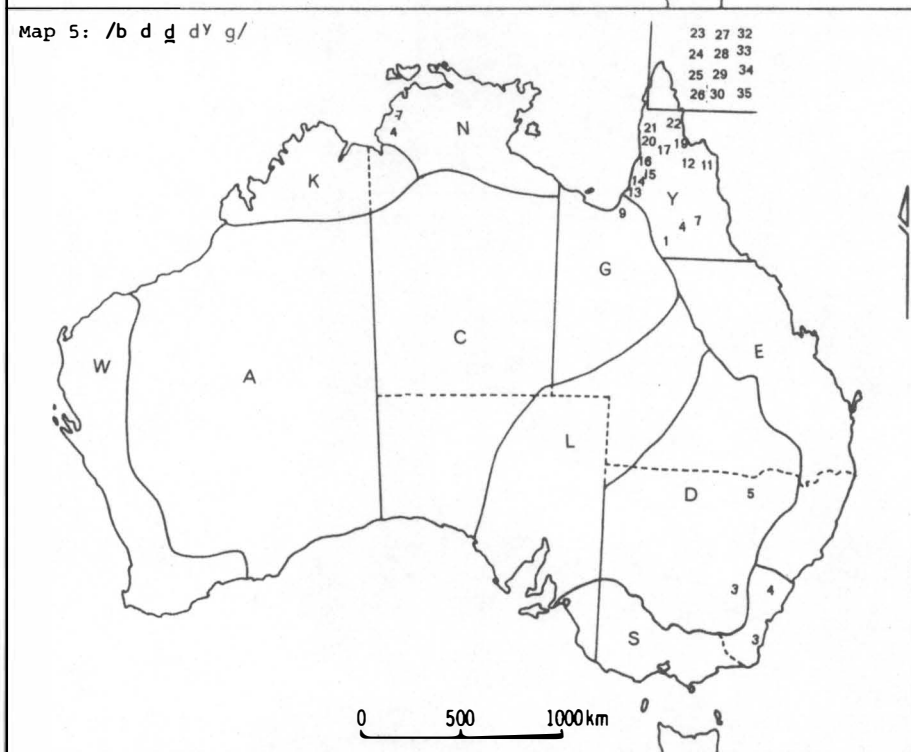
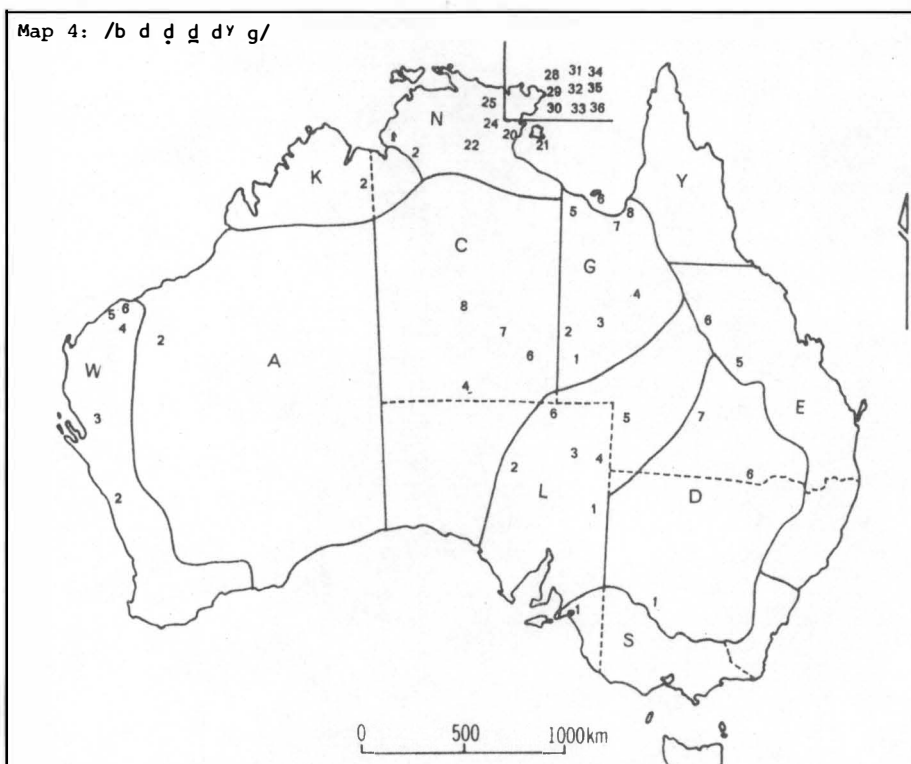
## AREA G

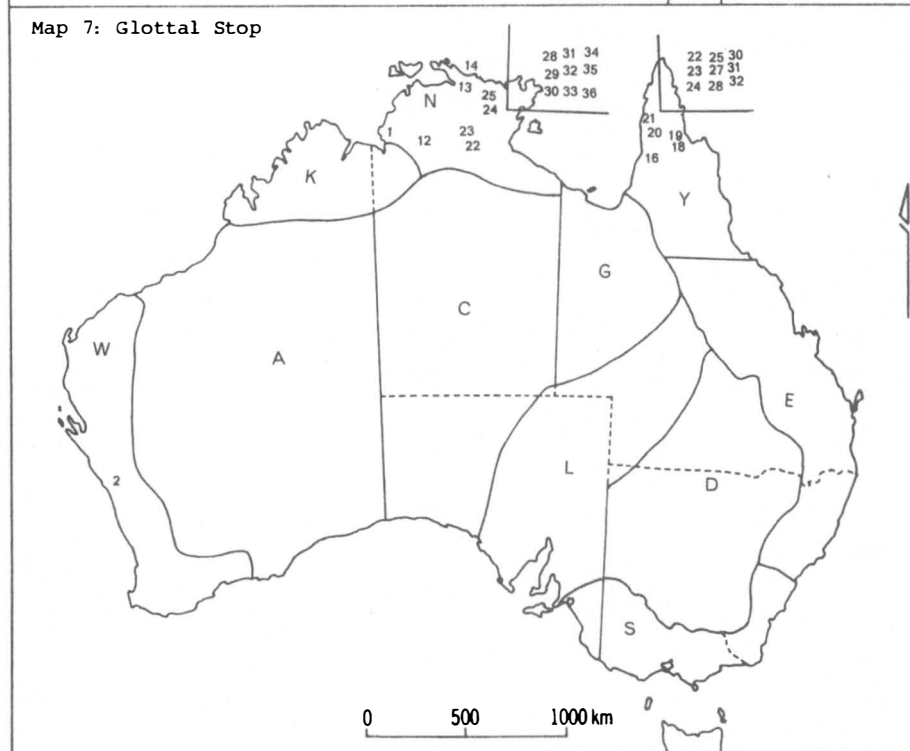
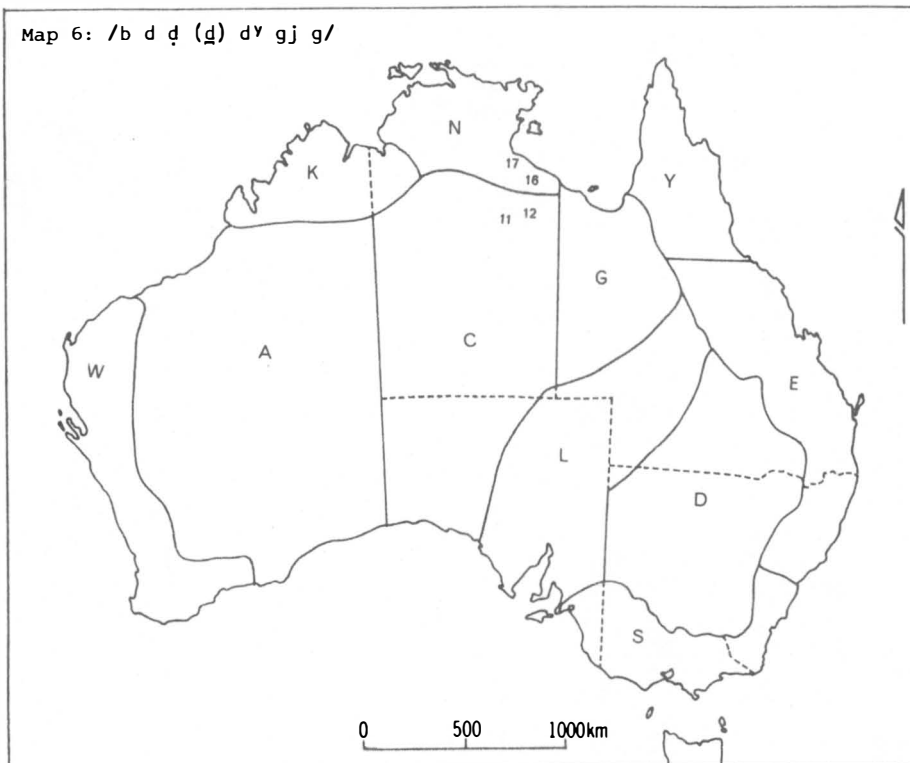
1	Pita-pita	4	Ngawun	7	Kukatj
2	Waḷuwara	5	Yukulta	8	Kuthant
3	Kalkatungu	6	Lardil	9	Kurtjar

## AREA W

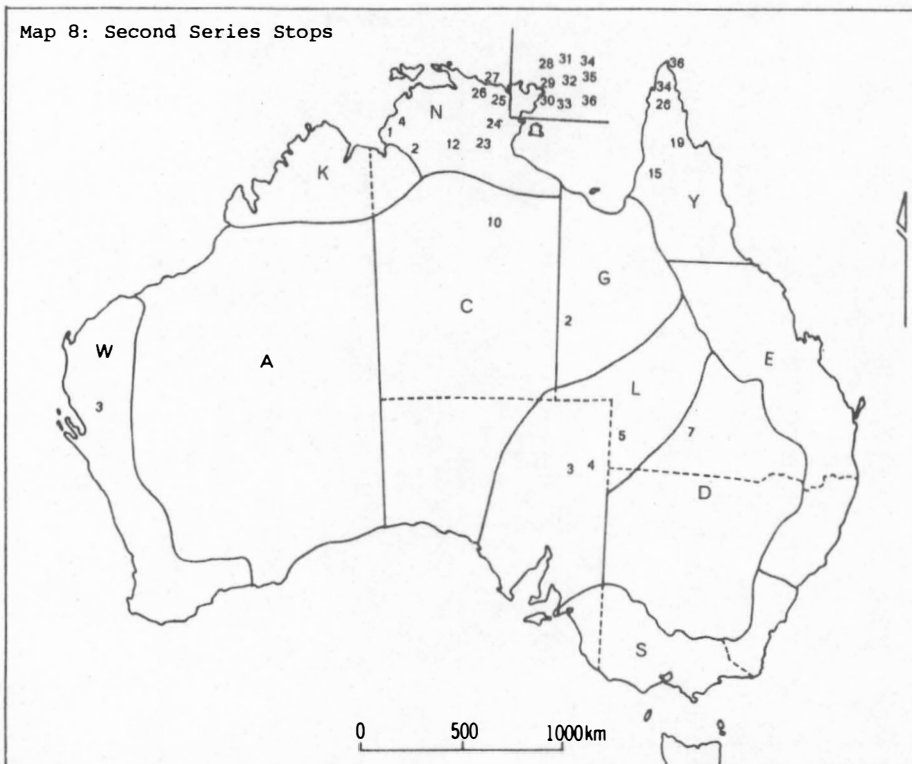
1	NjungaR	4	Yinytyiparnti	6	Ngaḷuma
2	Nanta	5	Kurama	7	Ngarla
3	Thargari				



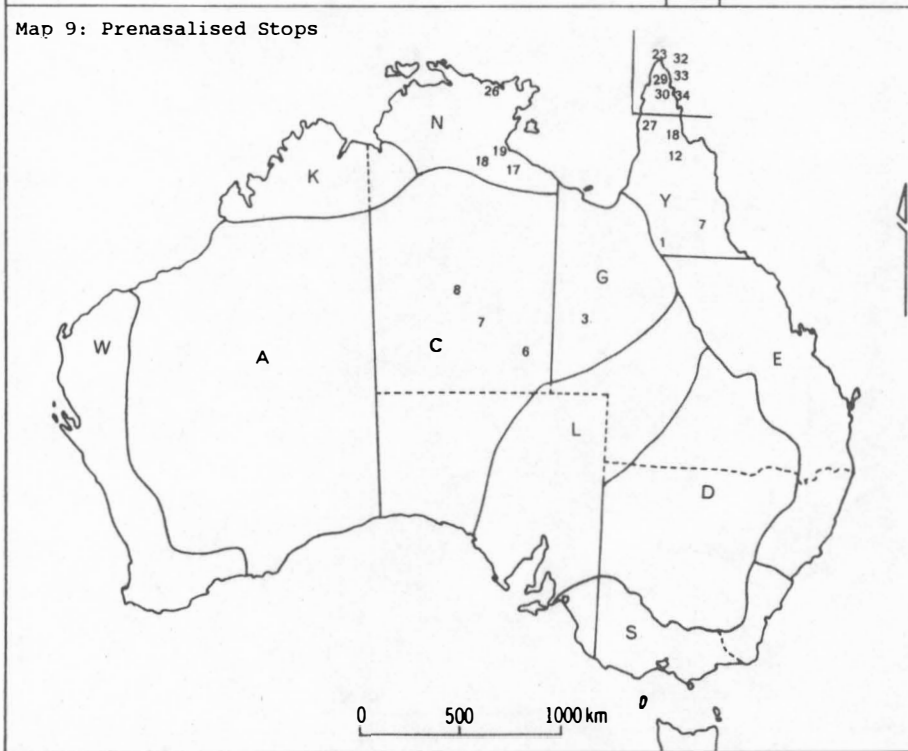


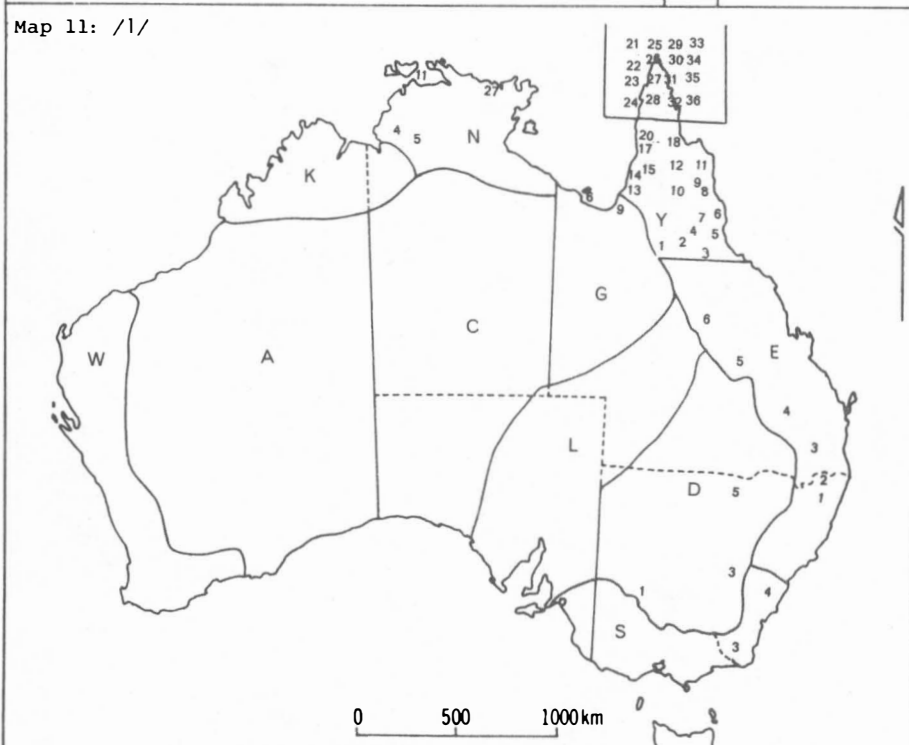
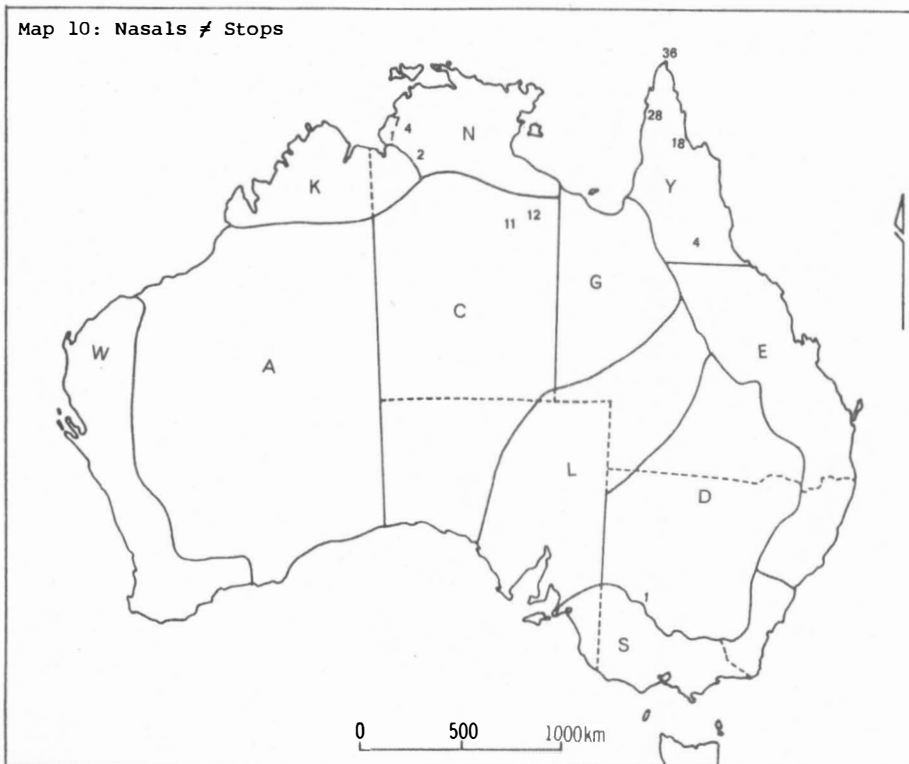


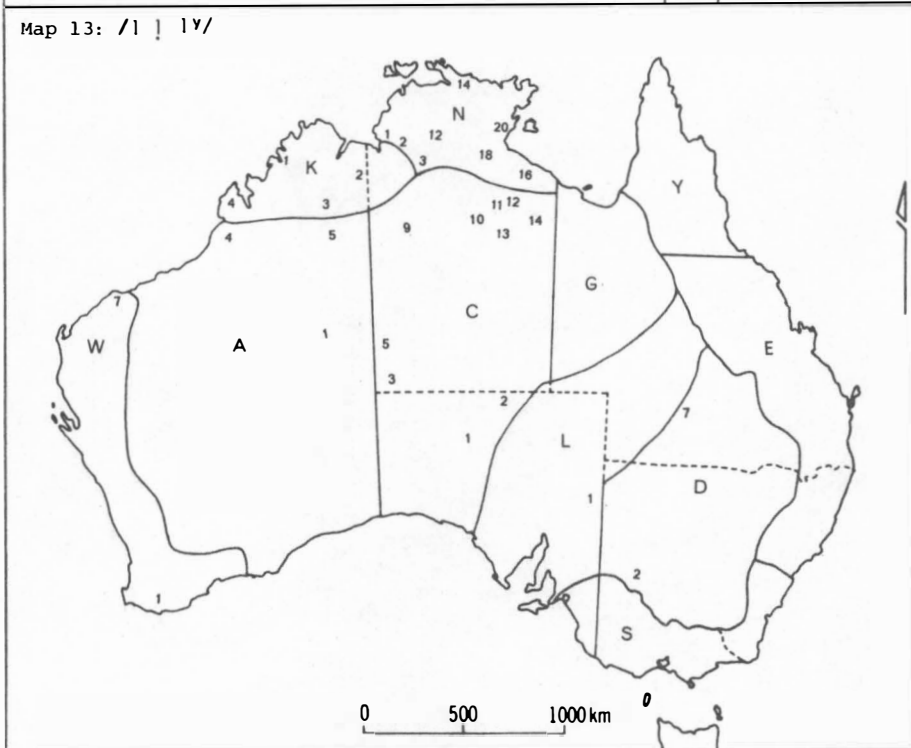
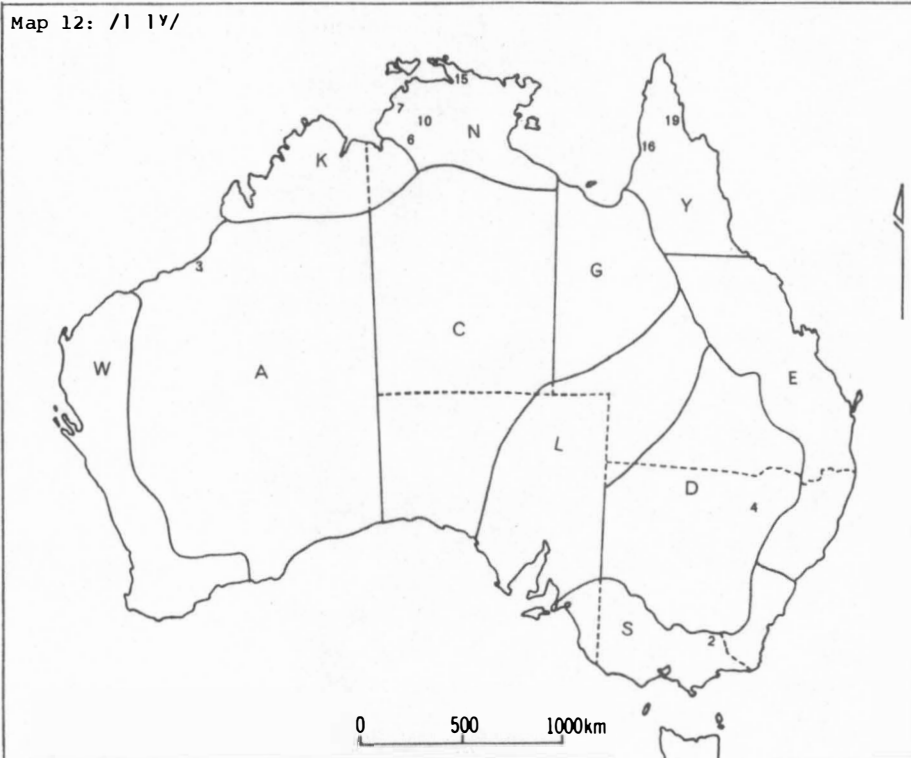
Map 8: Second Series Stops

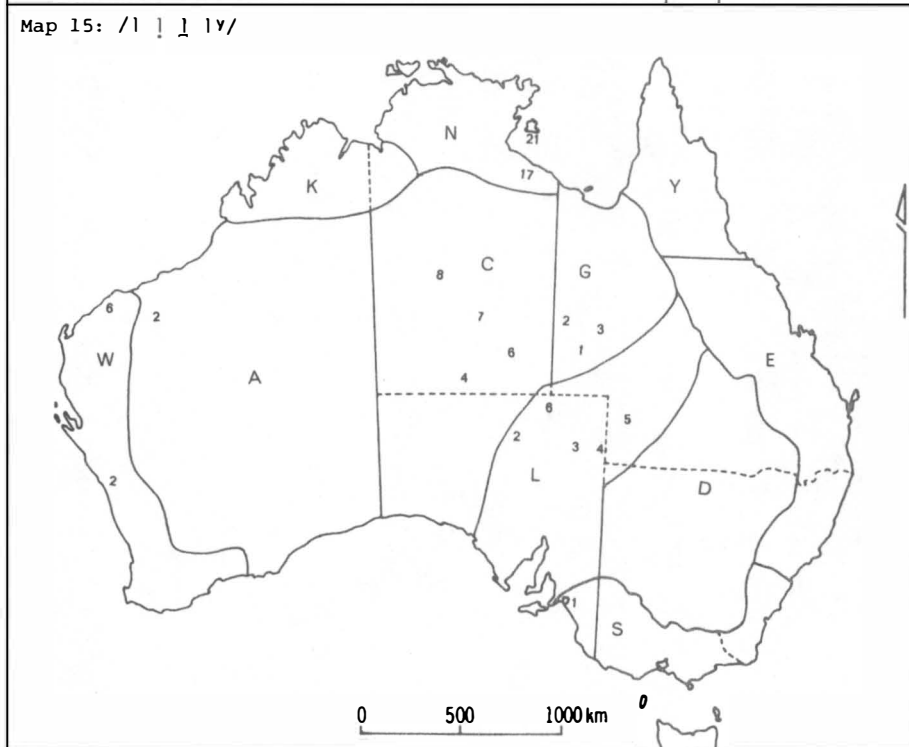
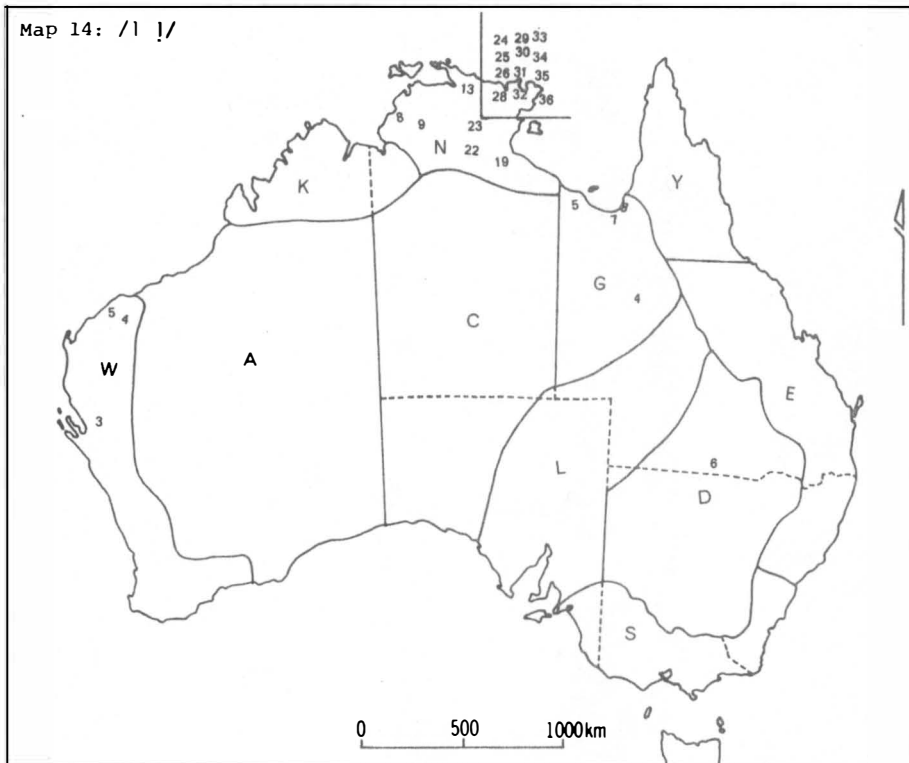


Map 9: Prenasalised Stops

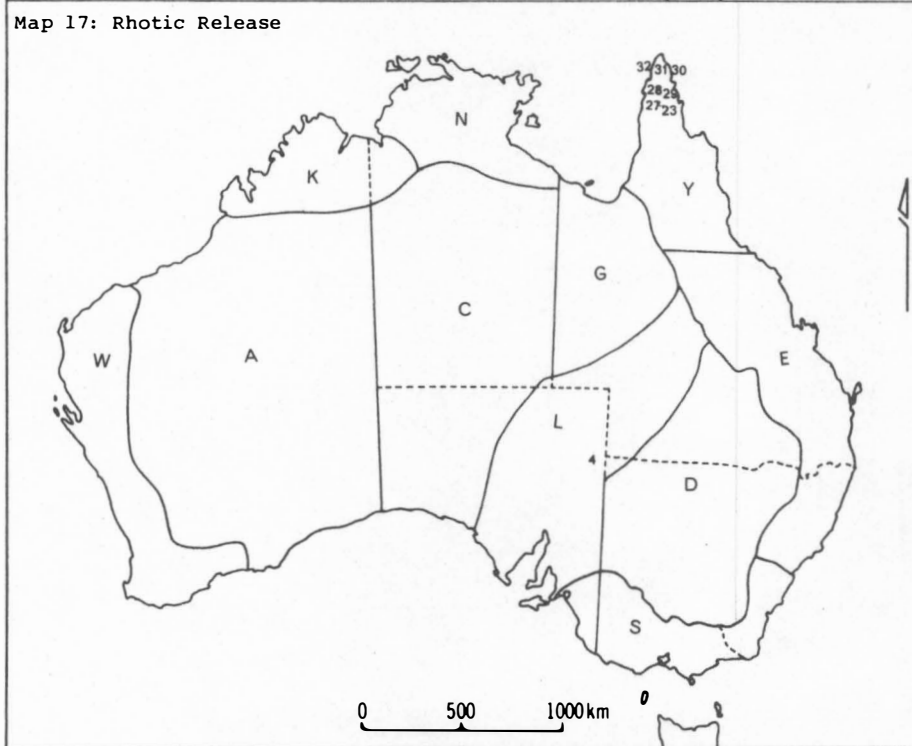
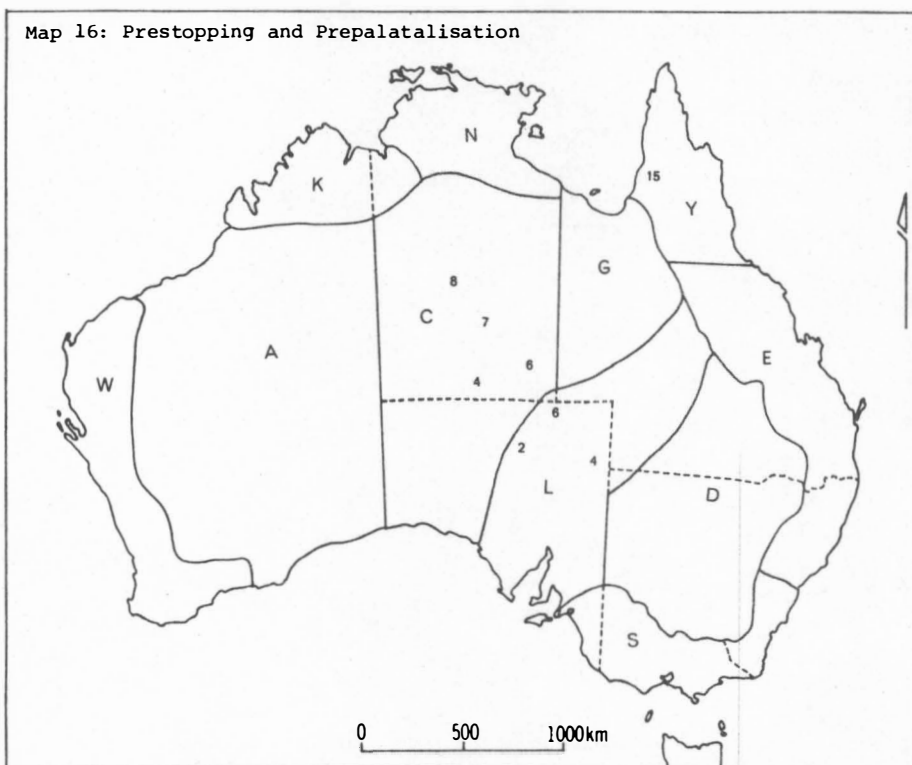


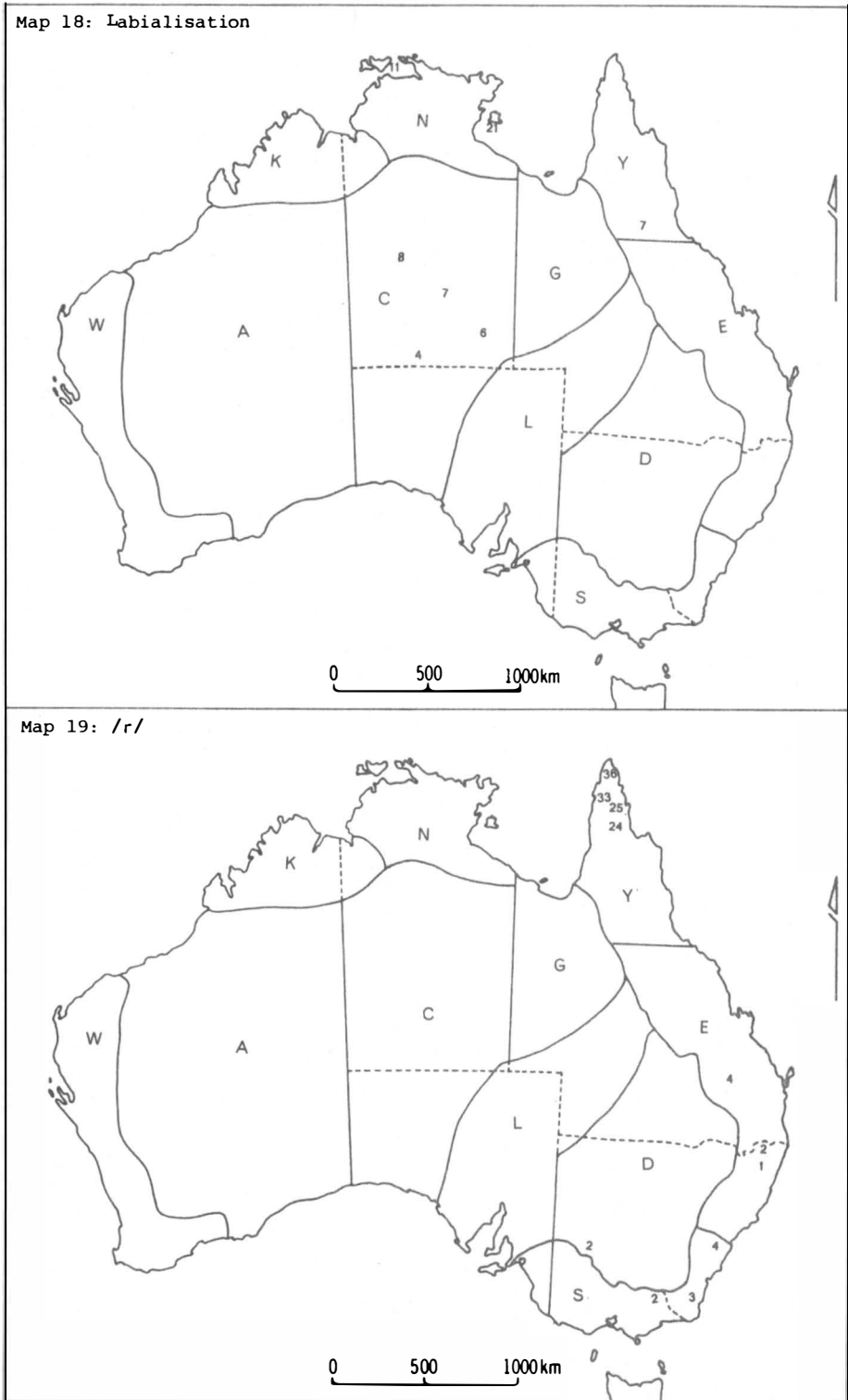




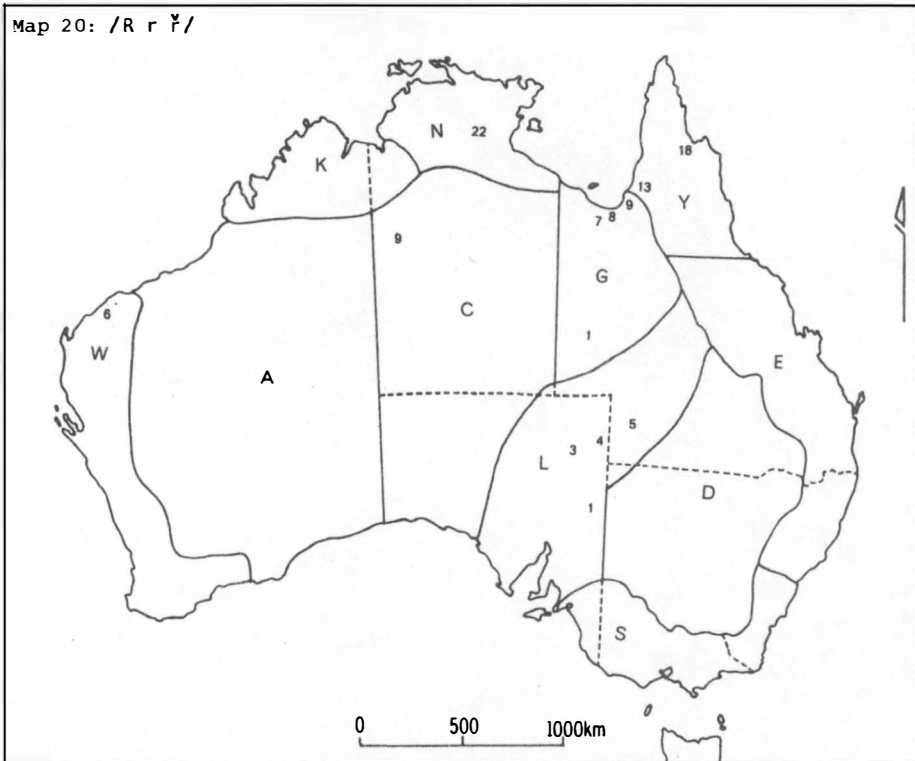




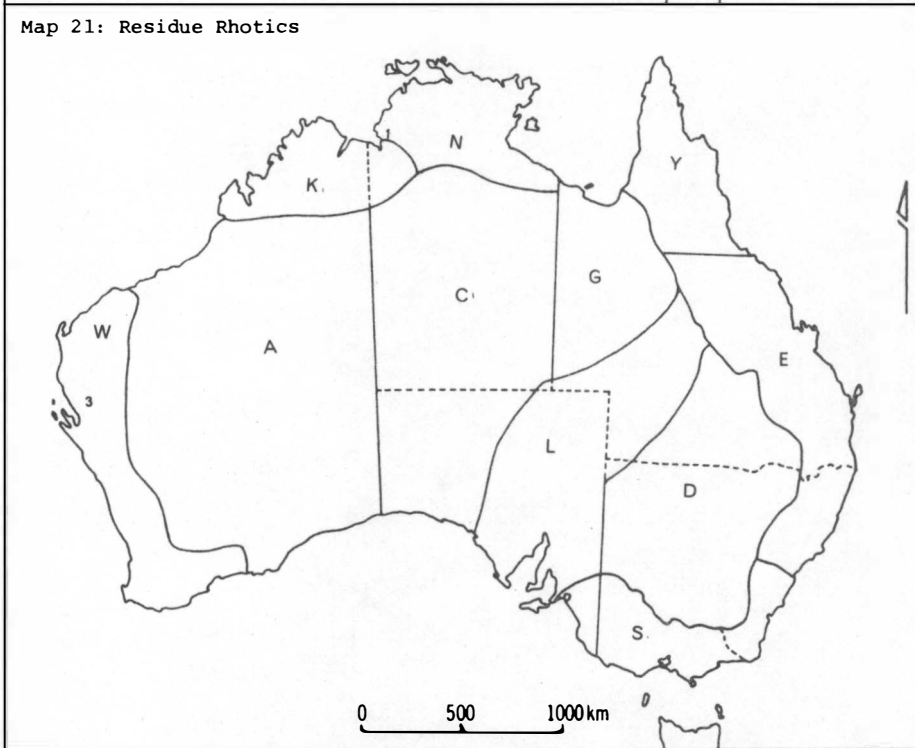




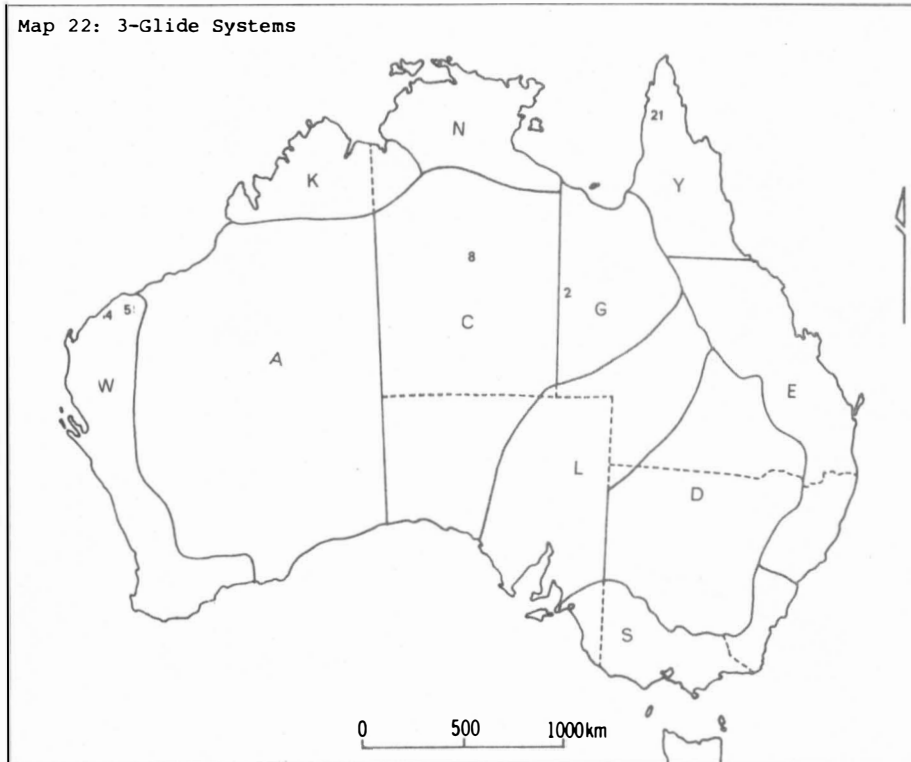
Map 20: /R r ʀ/



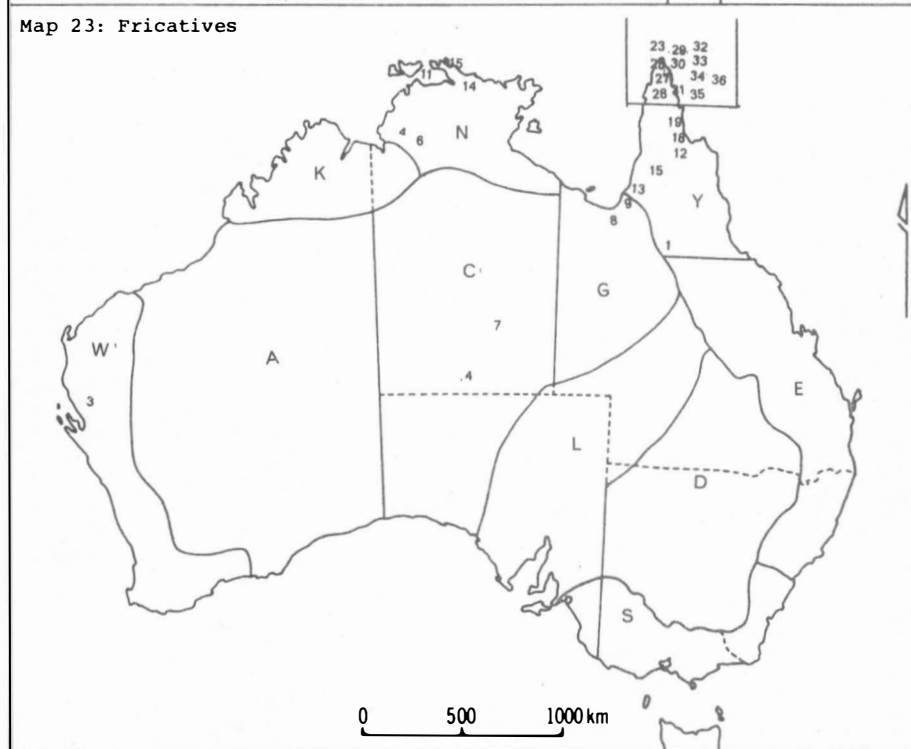
Map 21: Residue Rhotics

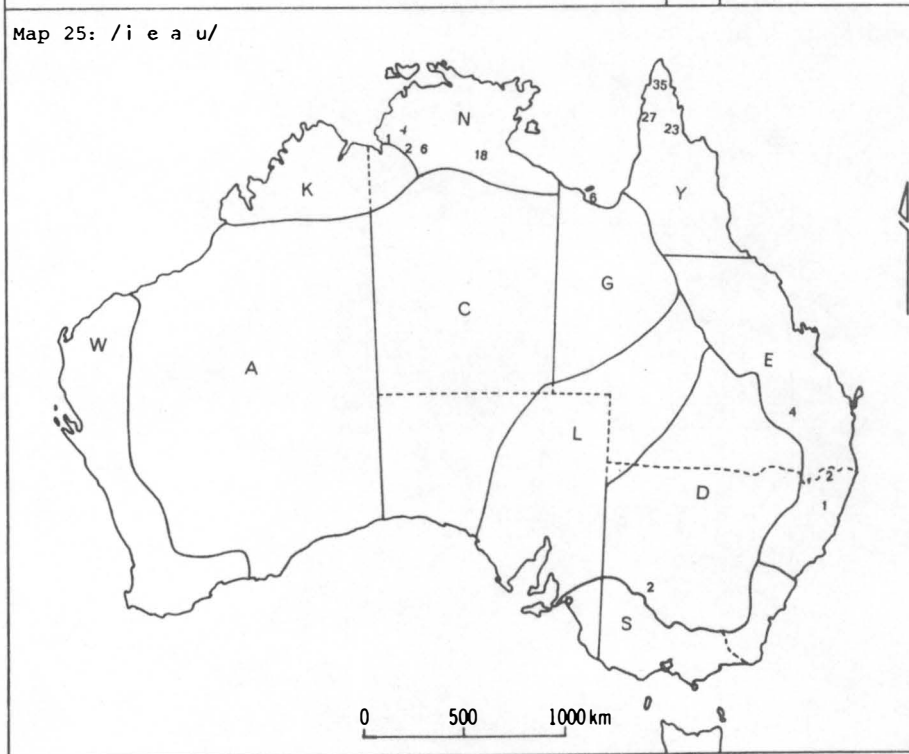
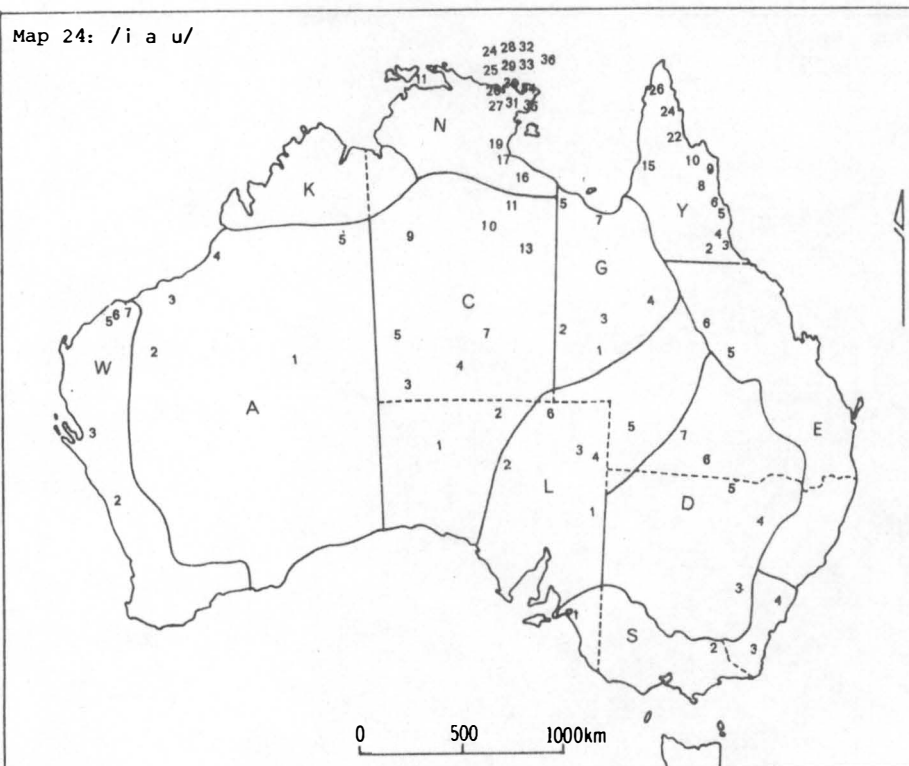


Map 22: 3-Glide Systems

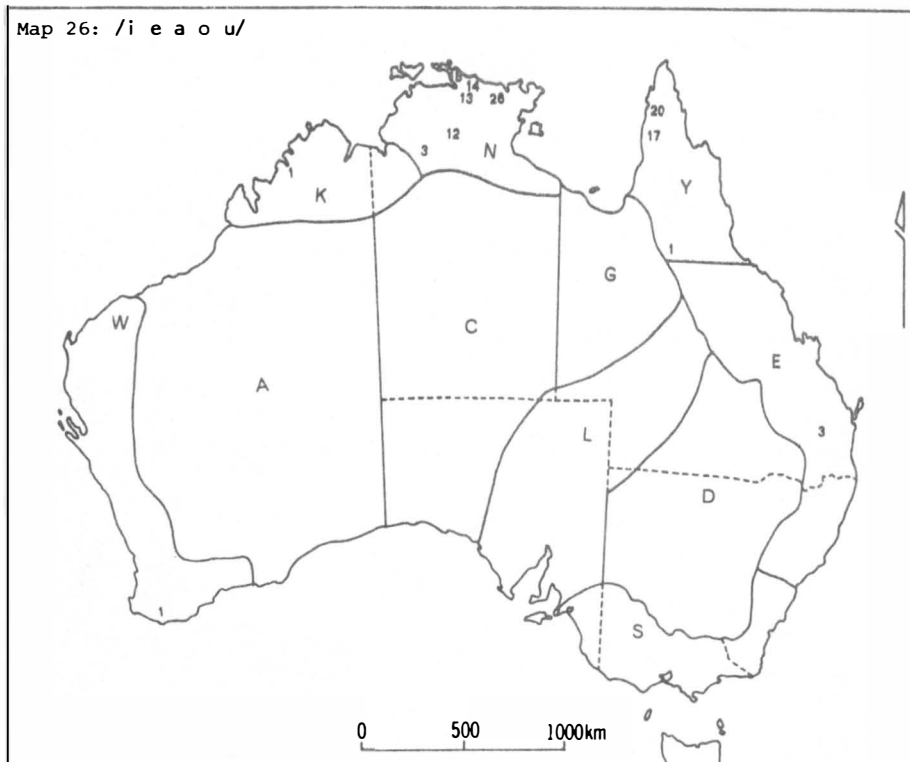


Map 23: Fricatives

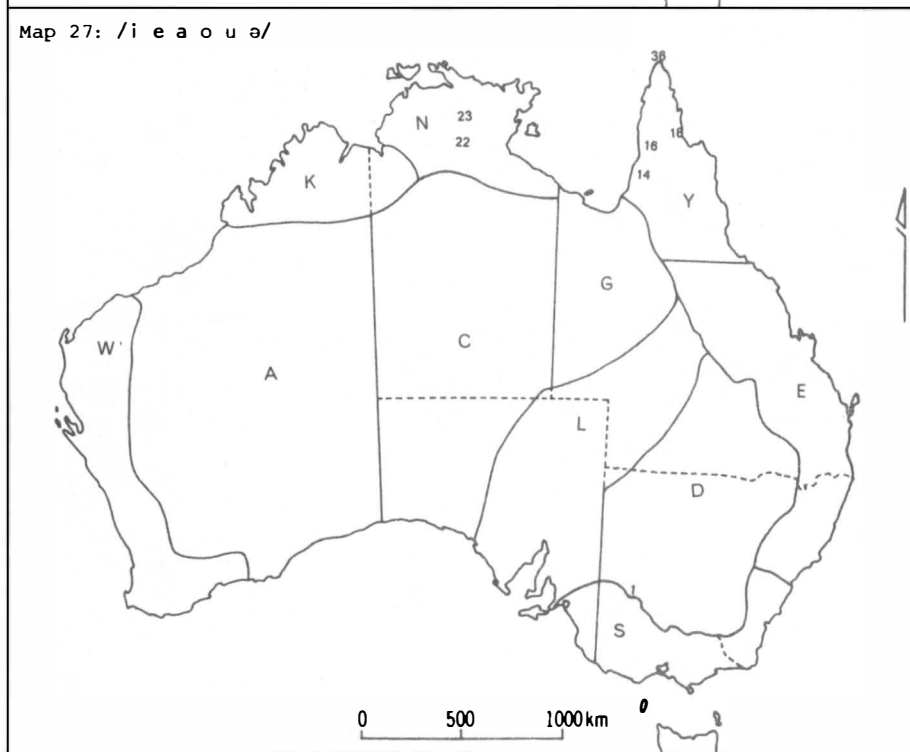




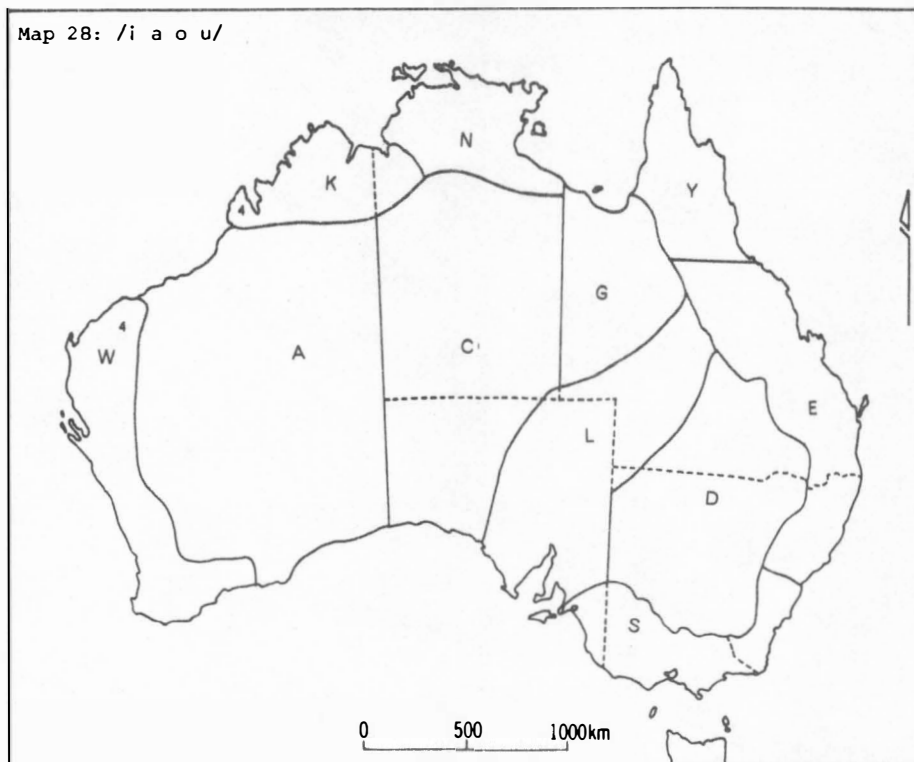
Map 26: /i e a o u/



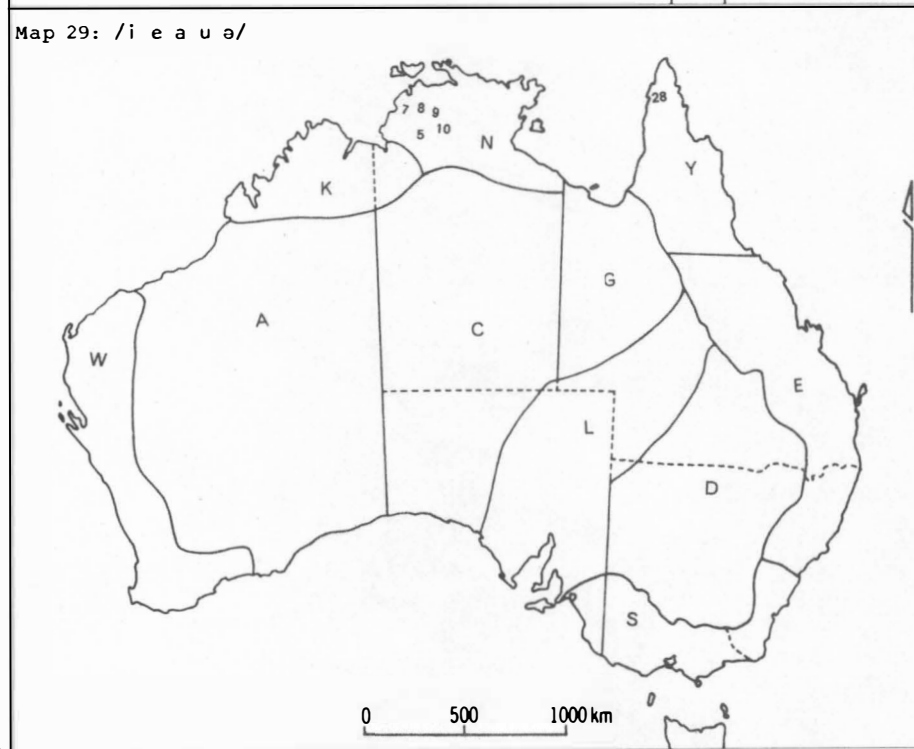
Map 27: /i e a o u ə/



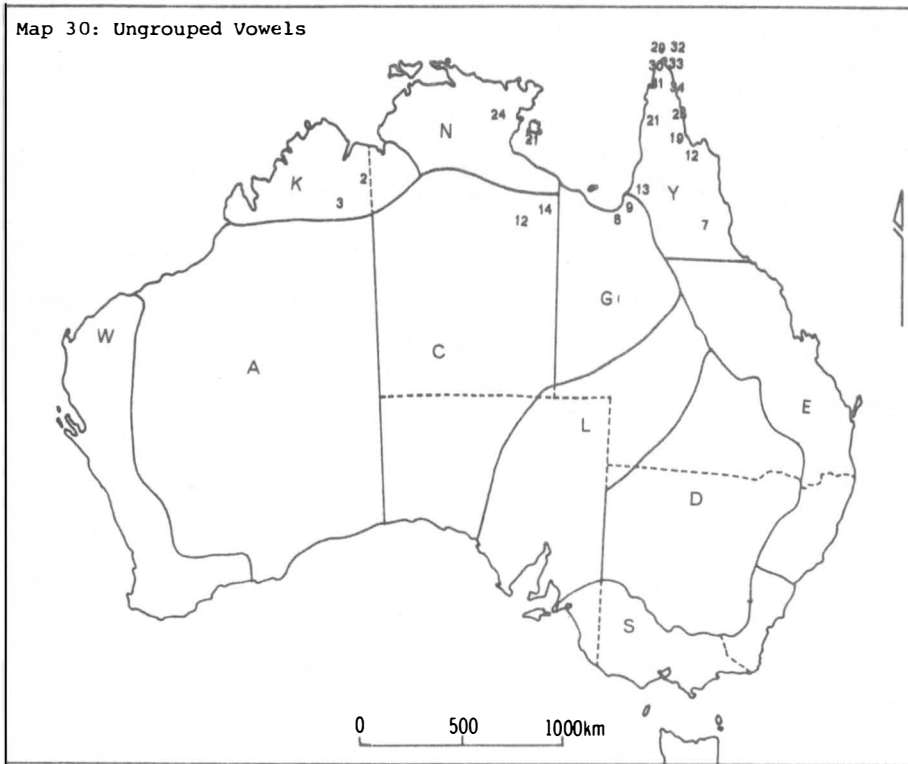
Map 28: /i a o u/



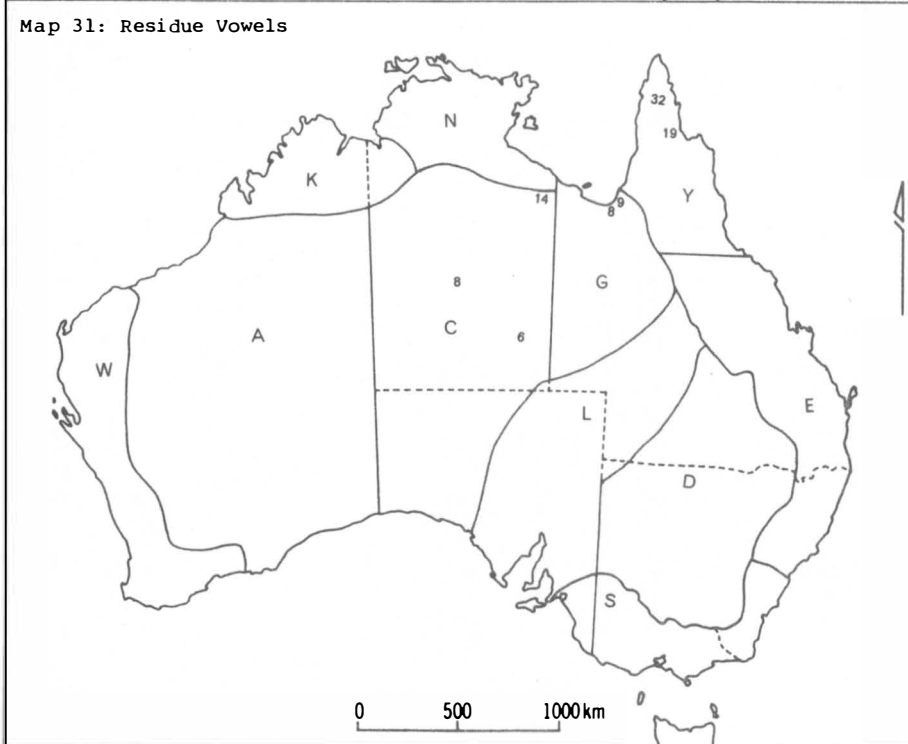
Map 29: /i e a u ə/



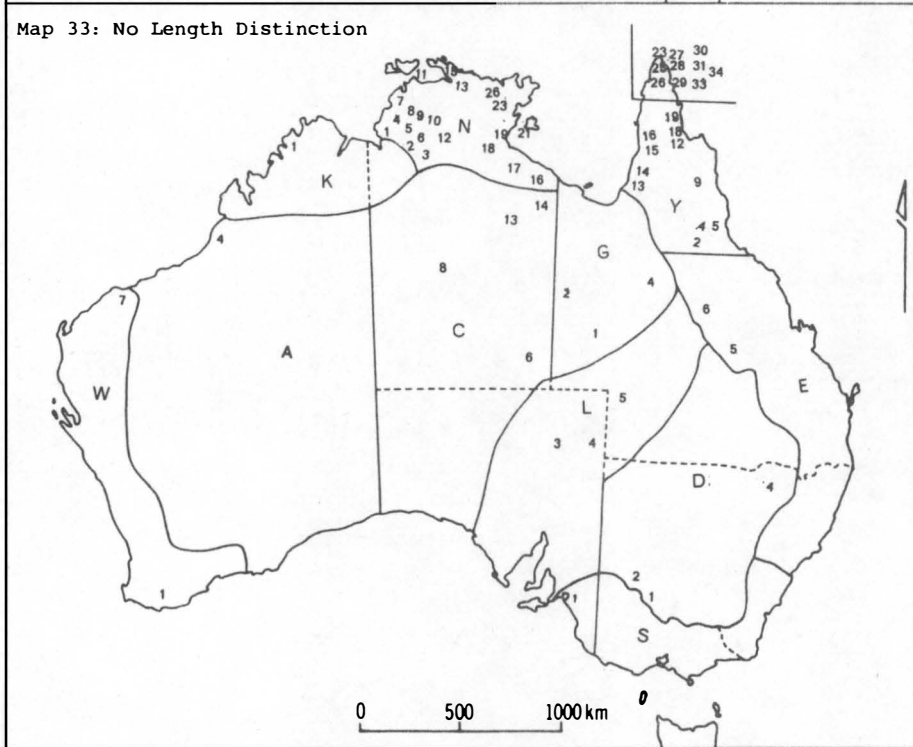
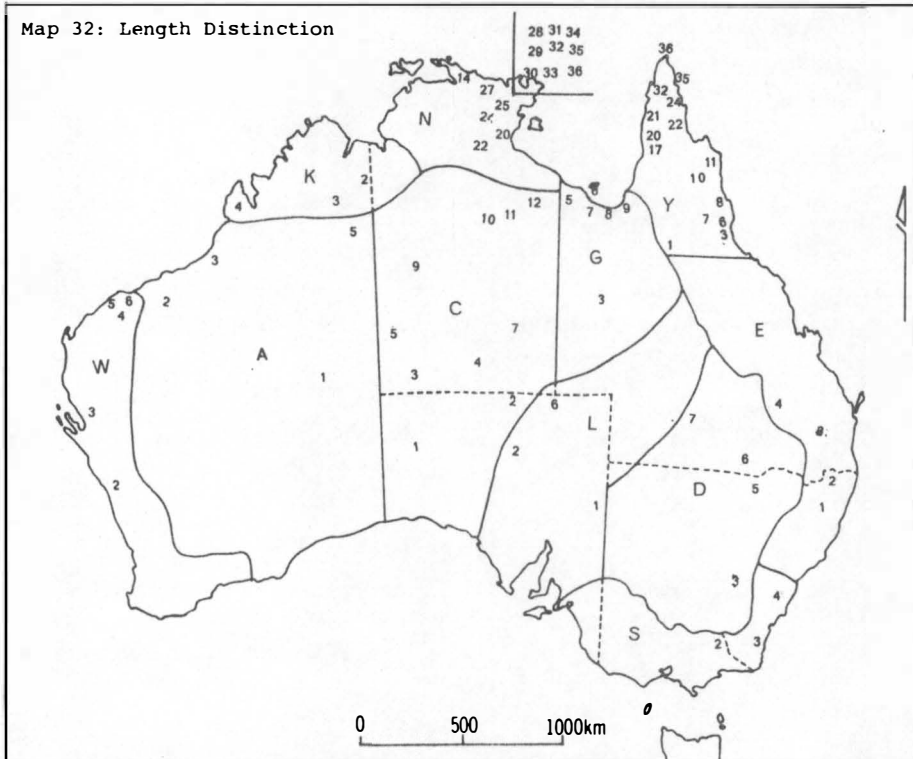
Map 30: Ungrouped Vowels



Map 31: Residue Vowels







APPENDIX 2  
Language References

Order: a, u, b/p, g/k, dy/dj, dh/th, d/t, m, ng, ny/nj, n, l, r, w, y.

The number after each language name indicates the A.I.A.S. area number.

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| Andiljaugwa (N151)                   | O'Grady, Voegelin and Voegelin 1966  |
| Dixon, R.M.W. Personal communication | Strehlow 1944                        |
| Stoker 1976                          |                                      |
|                                      | Arabana (L13)                        |
|                                      | Hale 1959a                           |
| Alyawarra (C14)                      | Hercus 1972                          |
| Breen 1967                           | O'Grady, Voegelin and Voegelin 1966  |
| Koch, H. Personal communication      |                                      |
| Turtle 1977                          |                                      |
| Yallop 1977                          | Awngdim (Y39.1)                      |
|                                      | Hale 1976a                           |
|                                      |                                      |
| Alawa (N92)                          | Umbila (Y45)                         |
| Sharpe 1972                          | Harris and O'Grady 1976              |
|                                      |                                      |
| Aridingidigh (Y35)                   | Umbuygamu (Y55)                      |
| Hale 1959-60, 1976a                  | Sommer 1976                          |
|                                      |                                      |
| Andagirinja (C5)                     | Pitjantjatjara (C6)                  |
| Brown 1977                           | Glass and Hackett 1970               |
|                                      | University of Adelaide 1969          |
|                                      |                                      |
| Andageribina (C12)                   | Burera (N82)                         |
| Breen 1967, 1977a                    | Dixon, R.M.W. Personal communication |
|                                      | Glasgow 1966                         |
| Aranda (C8)                          | Glasgow and Glasgow 1962             |
| Capell 1967                          | Tryon 1974                           |
| Koch, H. Personal communication      |                                      |

- |   |   |
|---|---|
| Pita-pita (G6)<br>Blake and Breen 1971                                | Kuthant (G31)<br>Black 1980   |
| Brinken (N7)<br>O'Grady, Voegelin and Voegelin<br>1966<br>Tryon 1974  | Gudandji (C26)<br>Aguas 1968<br><br>Kurama (W36)<br>O'Grady 1966  |
| Pungu-pungu (N11)<br>Tryon 1974                                       | Wordick, F. Personal communication  |
| Bidyara (E37)<br>Breen 1973   | Garadjari (A64)<br>Capell 1962  |
| Bard (K15)<br>Metcalfe 1975<br>O'Grady, Voegelin and Voegelin<br>1966 | Gureng-gureng (E32)<br>Brasch 1975<br><br>Gidabal (E14)<br>Geytenbeek and Geytenbeek 1971                               |
| Pintupi (C10)<br>Hansen and Hansen 1969<br>Huttar 1976                | Gugada (C3)<br>Platt 1972   |
| Bailko (A55)<br>O'Grady, Voegelin and Voegelin<br>1966                | Kitja (K20)<br>Taylor and Taylor 1971   |
| Kaititj (C13)<br>Koch, H. Personal communication,<br>1974-            | Kuuku-Thaypan (Y71)<br>Rigsby 1976  |
| Kuuku-Ya?u (Y22)<br>Rigsby 1972<br>Thompson 1976                      | Koko-Bera (Y85)<br>Black and Alpher n.d.  |
| Kurtjar (G33)<br>Black 1980<br>Keen 1968                              | Kalkatungu (G13)<br>Blake 1969  |
| Gunwinggu (N65)<br>Carroll 1976<br>Oates 1964                         | Guugu-Yimidhirr (Y82)<br>Haviland, J. Personal communication<br>Zwaan, de 1969<br><br>Gugu-Badhun (Y128)<br>Sutton 1973 |

- Garawa (N155)  
Furby 1974  
Huttar and Kirton 1978
- Gungabula (E35)  
Breen 1973
- Galpu (N139)  
Wood 1977
- Gubabuyngu (N112.1)  
Dixon, R.M.W. Personal communication  
O'Grady, Voegelin and Voegelin 1966
- Gugu-Yalanji (Y99)  
Oates, Oates et al. 1964  
Wurm 1972
- Kukatj (G28)  
Black 1975  
Breen 1976a
- Kunjen (Y83)  
Dixon 1970a  
Sommer 1972
- Gor-Nar (Y91)  
Breen 1976b
- Djamindjung (N18)  
Walsh, M.J. Personal communication
- Djaru (K12)  
Tsunoda 1978
- Djaabugay (Y106)  
Hale 1976b
- Dyirbal (Y123)  
Dixon 1972
- Djambarrpuynggu (N115)  
Henley, J. Personal communication, 1978a
- Djeebana (N74)  
McKay 1975a
- Djabu (N145)  
Henley, J. Personal communication, 1978b
- Djingili (C22)  
Chadwick 1975  
Hale 1960a
- Thargari (W21)  
Austin, P. Personal communication  
Klokeid 1969
- Dharawal (S59)  
Eades 1976
- Dhurga (S53)  
Eades 1976
- Thaayore (Y69)  
Hall 1968
- Dalabon (N76)  
Capell 1962  
O'Grady, Voegelin and Voegelin 1966
- Tiwi (N20)  
Breen 1977b  
Osborne 1974
- Datiway (N116.F)  
Schebeck 1967
- Diyari (L17)  
Austin 1977, 1978a  
Trefry 1974

- Mbara (Y131)  
Sutton 1976
- Maung (N64)  
Capell 1962  
O'Grady, Voegelin and Voegelin  
1966
- Madi-madi (D8)  
Hercus 1969
- Maranunggu (N13)  
Tryon 1970
- Mulurudji (Y97)  
O'Grady, Voegelin and Voegelin  
1966
- Malag-malag (N22)  
Birk 1975
- Malyangapa (L8)  
Austin 1978b  
O'Grady, Voegelin and Voegelin  
1966
- Mantjiltjara (A51.1)  
Marsh 1969
- Murinbata (N3)  
Walsh 1972-, 1976
- Mpakwithi (Y20)  
Crowley 1975a, 1981
- Mara (N112)  
Busby 1978  
Hale 1959b
- Mayali (N44)  
Merlan 1976
- Muruwari (D32)  
Oates 1976
- Mandelbingu (N116.0)  
Schebeck 1967
- Mabuiag (Y1-4)  
Klokeid 1971
- Mbabaram (Y115)  
Dixon, R.M.W. Personal communication
- Mbeiwum (Y41)  
Hale 1976a
- Mbalidjan (Y25)  
Hale 1976a
- Margany (D42)  
Breen 1981
- Nganjaywana (D24)  
Crowley 1976
- Nggod (Y36)  
Hale 1976a
- Ngawun (G17)  
Breen 1972-
- Ngarndji (C22.1)  
Chadwick 1971
- Ngarigu (S46)  
Hercus 1969
- Ngaḷuma (W38)  
O'Grady, Voegelin and Voegelin  
1966
- Ngarla (W40)  
O'Grady, Voegelin and Voegelin  
1966

- |   |   |
|---|---|
| Ngengomeri (N17)<br>Tryon 1974  | Ritharngu (N104)<br>Heath 1978  |
| Ngiyamba (D10.1)<br>Donaldson 1977  | Rembarnga (N73)<br>McKay 1975b  |
| Ngarinjin (K18)<br>Coate and Oates 1970                                   | Wangganguru (L27)<br>Hercus 1972  |
| Ngangikurrungurr (N8)<br>Courtenay 1976                                   | Wangumara (L25)<br>Breen 1974   |
| NjungaR (W1-2)<br>Douglas 1976  | Wangurri (N134)<br>Schebeck 1967  |
| Nyangumarda (A61)<br>Hoard and O'Grady 1976<br>O'Grady 1964               | Wagilak (N106)<br>Schebeck 1967   |
| Nanta (W14)<br>O'Grady, Voegelin and Voegelin<br>1966                     | Warramiri (N131)<br>Schebeck 1967   |
| Nunggubuyu (N128)<br>Hughes and Healey 1971<br>Hughes and Leeding 1971a,b | Wadyiginy (N6)<br>Tryon 1974  |
| Ndra'angid (Y39)<br>Hale 1976   | Wikmumin (Y43)<br>O'Grady, Voegelin and Voegelin<br>1966                      |
| Lenngidigh (Y26)<br>Hale 1976a  | Wambaya (C19)<br>Campbell 1976  |
| Ludigh (Y12)<br>Hale 1976a  | Walmatjari (A66)<br>Hudson and Richards 1969                                  |
| Lardil (G38)<br>Klokeid 1976  | Wargamay (Y134)<br>Dixon 1981   |
| Lama-lama (Y58)<br>Laycock 1969   | Waramunga (C18)<br>Capell 1953<br>Chakravarti 1967<br>Hale 1959c<br>Wurm 1972 |

- |  |   |
|--|---|
| Wikmunkan (Y57)<br>Hale 1959d<br>Sayers 1964, 1976             | Yathaikana (Y8)<br>Crowley, T. Personal communication,<br>1975b           |
| Wik-Ep (Y52)<br>Hale 1960b                                     | Yukulta (G34)<br>Keen 1970, 1972  |
| Wemba-wemba (D1)<br>Hercus 1969                                | Yinytyiparnti (W37)<br>O'Grady 1966<br>Wordick, F. Personal communication |
| Waḍaman (N35)<br>Merlan 1976                                   | Yuwaalaraay (D23)<br>Williams 1976  |
| Waalubal (E12.1)<br>Crowley 1978                               | Yiwadja (N39)<br>Capell 1962<br>O'Grady, Voegelin and Voegelin<br>1966    |
| Waka-waka (E28)<br>Wurm 1976                                   | Yir-Yoront (Y72)<br>Alpher 1976<br>Black and Alpher n.d.                  |
| Walpiri (C15)<br>Capell 1962<br>Jagst 1975                     | Yinwum (Y29)<br>Hale 1976a  |
| Waḷuwara (G10)<br>Breen 1971                                   | Yidiny (Y117)<br>Dixon 1977   |
| Warungu (Y133)<br>Tsunoda 1974                                 | Yanhangu (N99.1)<br>Schebeck 1967   |
| Yanyula<br>Hale 1959e<br>Huttar and Kirton 1978<br>Kirton 1967 | Yaraldi (S8)<br>McDonald 1977   |
| Yandruwandha (L18)<br>Breen 1967-, 1976c                       |   |

BIBLIOGRAPHY

References cited as unpublished can be located in the library of the Australian Institute of Aboriginal Studies (A.I.A.S.).

AGUAS, E.F.

1968 'Gudandji'. *PL*, A-14:1-20.

ALPHER, B.

1976 'Phonological Peculiarities of Yir-Yoront Song Words'.  
In Sutton, ed. 1976:78-83.

AUSTIN, P.

1977 Diyari fieldnotes and tapes. (by permission)

1978a A Grammar of the Diyari Language of North East South  
Australia. Ph.D. thesis, Australian National University,  
Canberra.

1978b Outline of a sketch grammar of the Malyangapa language.  
Unpublished paper.

BIRK, D.B.W.

1975 'The Phonology of MalakMalak'. *PL*, A-39:59-78.

BLACK, P.

1975 Kukatj: final report. Unpublished paper (by permission).

1980 'Norman Pama Historical Phonology'. In B. Rigsby and P.  
Sutton, eds *PL*, A-59:181-239.



- BLACK, P. and B. ALPHER  
n.d. Writing Koko-Bera and Koko-Minjen. Unpublished paper.
- BLAKE, B.J.  
1969 *The Kalkatungu Language: A Brief Description.* AAS 20, L8.  
Canberra: A.I.A.S.
- BLAKE, B.J., ed.  
1974 *Papers in Australian Aboriginal Languages. Linguistic Communications* 14. Melbourne: Monash University.
- BLAKE, B.J. and J.G. BREEN  
1971 *The Pitta-Pitta Dialects. Linguistic Communications* 4.  
Melbourne: Monash University.
- BLAKE, B.J. and R.M.W. DIXON  
1979 Introduction to Dixon and Blake, eds 1979:1-25.
- BRASCH, S.  
1975 Gureŋ Gureŋ: A Language of the Upper Burnett River South-east Queensland. B.A. (Hons.) subthesis, Australian National University, Canberra.
- BREEN, J.G.  
1967 Andagerebina. Unpublished data.  
1967- Yandruwandha fieldnotes and tapes.  
1971 A Description of the Waḷuwara Language. M.A. thesis, Monash University, Victoria.  
1972- Ngawun. Unpublished data (by permission).  
1973 *Bidyara and Gungabula: Grammar and Vocabulary. Linguistic Communications* 8. Melbourne: Monash University.  
1974 'Notes on an Original Orthography (or The Dixon System of Spelling)'. In Blake, ed. 1974:59-68.  
1976a 'Gugadj and Gog-Nar: a Contrastive Sketch'. In Sutton, ed. 1976:151-162.

- 1976b 'An Introduction to Gog-Nar'. In Sutton, ed. 1976:243-259.
- 1976c 'Yandruwandha'. In Dixon, ed. 1976:594-597; 750-756.
- 1977a 'Andegerebinha Vowel Phonology'. *Phonetica* 34:371-391.
- 1977b A reanalysis of Tiwi /o/. Unpublished paper.
- 1981 'Margany and Gunya Grammar'. In Dixon and Blake, eds, 1981. In press.
- BROWN, M.
- 1977 Morphological Reconstruction of Proto-Western Desert. B.A. (Hons.) thesis, Australian National University, Canberra.
- BUSBY, P.
- 1978 A statement of Mara phonology and pronominals. Unpublished paper.
- CAMPBELL, S.
- 1976 An outline of the grammar of Wambaya. Unpublished paper.
- CAPELL, A.
- 1953 'Notes on the Waramunga Language, Central Australia'. *Oceania* 23/4:297-311.
- 1962 *Some Linguistic Types in Australia. Oceania Linguistic Monographs* 7.
- 1967 'Sound Systems in Australia'. *Phonetica* 16:85-110.
- CARROLL, P.J.
- 1976 Kunwinjku: A Language of Western Arnhem Land. M.A. thesis, Australian National University, Canberra.
- CHADWICK, N.
- 1971 'Ngarndji Wordlist and Phonological Key'. *Papers on the Languages of Australian Aboriginals*:34-45. AAS 38, L16. Canberra: A.I.A.S.

- 1975      *A Descriptive Study of the Djingili Language.* AAS, RRS2.  
          Canberra: A.I.A.S.
- CHAKRAVARTI, P.
- 1967      A report on WaRaŋungu. Unpublished paper.
- COATE, H.H.J. and L.F. OATES
- 1970      *A Grammar of Ngarinjin, Western Australia.* AAS 25, L10.  
          Canberra: A.I.A.S.
- COURTENAY, K.
- 1976      *Nangikurungurr Alphabet Book.* Darwin: School of Australian  
          Linguistics, Darwin Community College.
- CROWLEY, T.M.
- 1975a     Mpakwithi fieldnotes and tapes.
- 1975b     Yadhaykenu fieldnotes and tapes.
- 1976      'Phonological Change in New England'. In Dixon, ed. 1976:  
          19-50.
- 1978      *The Middle Clarence Dialects of Bandjalang.* AAS, RRS12.  
          Canberra: A.I.A.S.
- 1981      'The Mpakwithi Dialect of Anguthimri'. In Dixon and Blake,  
          eds, 1981. In press.
- DIXON, R.M.W.
- 1970a     'Olgolo Syllable Structure and What They are Doing About  
          It'. *Linguistic Inquiry* 1/2:273-276.
- 1970b     'Proto-Australian Laminals'. *Oceanic Linguistics* 9/2:79-  
          103.
- 1972      *The Dyirbal Language of North Queensland.* London:  
          Cambridge University Press.
- 1977      'Some Phonological Rules in Yidin<sup>y</sup>'. *Linguistic Inquiry*  
          8/1:1-34.

- 1980     *The Languages of Australia*. Cambridge: Cambridge University Press.
- 1981     'Wargamay Grammar'. In Dixon and Blake, eds, 1981. In press.
- DIXON, R.M.W., ed.
- 1976     *Grammatical Categories in Australian Languages*. AAS, L22. Canberra: A.I.A.S.
- DIXON, R.M.W. and B.J. BLAKE, eds
- 1979     *Handbook of Australian Languages*, vol.1. Canberra: ANU Press.
- 1981     *Handbook of Australian Languages*, vol.2. Canberra: ANU Press, and Amsterdam: John Benjamins.
- DONALDSON, T.
- 1977     A Description of Ngiyamba:, the Language of the Waṅa:ybuwan People of Central Western New South Wales. Ph.D. thesis, Australian National University, Canberra.
- DOUGLAS, W.H.
- 1976     *The Aboriginal Languages of the South-West of Australia*. 2nd edition. AAS RRS9. Canberra: A.I.A.S.
- EADES, D.K.
- 1976     *The Dharawal and Dhurga Languages of the New South Wales South Coast*. AAS, RRS8. Canberra: A.I.A.S.
- FERGUSON, C.A.
- 1966     'Assumptions About Nasals: A Sample Study in Phonological Universals'. In J.H. Greenberg, ed. *Universals of Language*, 53-60. (2nd edition). Massachusetts: M.I.T. Press.
- FURBY, C.E.
- 1974     'Garawa Phonology'. PL, A-37:1-11.
- GEYTENBEEK, B. and H. GEYTENBEEK
- 1971     *Gidabal Grammar and Dictionary*. AAS 43, L.17. Canberra: A.I.A.S.

## GLASGOW, D.

- 1966 *Notes on the Burera Sound System (North Arnhem Coast)*.  
Darwin: Education Section of the Welfare Branch, N.T.A.

## GLASGOW, D. and K. GLASGOW

- 1962 'The Phonemes of Burera'. *PL*, A-10:1-14.

## GLASS, A. and D. HACKETT

- 1970 *Pitjantjatjara Grammar: A Tagmemic View of the Ngaanyatjara (Warburton Ranges) Dialect*. AAS 34, L13. Canberra: A.I.A.S.

## HALE, K.L.

- 1959a Arabana fieldnotes and tapes.
- 1959b Mara fieldnotes and tapes.
- 1959c Warumuju fieldnotes and tapes.
- 1959d Wik-munkaṅ fieldnotes and tapes.
- 1959e Yanyula fieldnotes and tapes.
- 1959-60 Northern-Paman fieldnotes. Unpublished data.
- 1960a Djingili fieldnotes and tapes.
- 1960b Wik-Ep or Wik-meṅ fieldnotes and tapes.
- 1976a 'Phonological Developments in a Northern Paman Language: Uradhi'. In Sutton, ed. 1976:41-49.
- 1976b 'T<sup>y</sup>a'pukay (Djaabugay)'. In Sutton, ed. 1976:236-242.

## HALL, A.H.

- 1968 A Depth-Study of the Thaayorr Language of the Edward River Tribe, Cape York Peninsula. M.A. thesis, University of Queensland.

## HANSEN, K.C. and L.E. HANSEN

- 1969 'Pintupi Phonology'. *Oceanic Linguistics* 8/2:153-170.

## HARRIS, B.P. and G.N. O'GRADY

- 1976 'An Analysis of the Progressive Morpheme in Umpila Verbs: A Revision of a Former Attempt'. In Sutton, ed. 1976: 165-212.

## HEATH, J.

- 1978 *Linguistic Diffusion in Arnhem Land*. AAS, RRS13. Canberra: A.I.A.S.

## HENLEY, J.

- 1978a Language elicitation notes and tapes.
- 1978b Video recording and notes.

## HERCUS, L.A.

- 1969 *The Languages of Victoria: A Late Survey*. AAS 17, L5 and L6. Canberra: A.I.A.S.
- 1972 'The Pre-stopped Nasal and Lateral Consonants of Arabana-Wanganuru'. *Anthropological Linguistics* 14/8:293-305.

## HOARD, J.E. and G.N. O'GRADY

- 1976 'Nyangumarda Phonology: a Preliminary Report'. In Dixon, ed. 1976:51-77.

## HUDSON, J. and E. RICHARDS

- 1969 'The Phonology of Walmatjari'. *Oceanic Linguistics* 8/2: 171-189.

## HUGHES, E.J. and A. HEALEY

- 1971 'The Nunggubuyu Verb'. *Papers on the Languages of Australian Aboriginals*: 46-57. AAS 38, L16. Canberra: A.I.A.S.

## HUGHES, E.J. and V.J. LEEDING

- 1971a 'The Phonemes of Nunggubuyu'. *Papers on the Languages of Australian Aboriginals*: 72-81. AAS 38, L16. Canberra: A.I.A.S.
- 1971b 'A Tentative Description of Nunggubuyu Clauses'. *Papers on the Languages of Australian Aboriginals*: 58-71. AAS 38, L16. Canberra: A.I.A.S.

HUTTAR, G.L.

1976 'Notes on Pintupi Phonology'. *Talanya* 3:14-24.

HUTTAR, G.L. and J. KIRTON

1978 Contrasts in Yanyuwa consonants. Paper delivered at the 1978 Australian Linguistic Society Conference, Canberra.

JAGST, L.

1975 'Ngardilpa (Warlpiri) Phonology'. *PL*, A-39:21-57.

KEEN, S.L.

1968 Kurtjar fieldnotes and tapes.

1970 Yukulta fieldnotes and tapes.

1972 A Description of the Yukulta Language - an Australian Aboriginal Language of North-west Queensland. M.A. thesis, Monash University.

KIRTON, J.F.

1967 'Anyula Phonology'. *PL*, A-10:15-28.

KLOKEID, T.J.

1969 *Thargari Phonology and Morphology*. *PL*, B-12.

1971 An outline of Mabuig phonology. Unpublished paper.

1976 Topics in Lardil Grammar. Ph.D. thesis, Massachusetts Institute of Technology.

KOCH, H.

1974- Kaititj fieldnotes and tapes.

LAYCOCK, D.C.

1969 'Three Lamalamic Languages of North Queensland'. *PL*, A-17:71-97.

## MCDONALD, M.

- 1977 A Study of the Phonetics and Phonology of Yaraldi and Associated Dialects. M.A. thesis, Australian National University, Canberra.

## MCKAY, G.R.

- 1975a Medial stop gemination in two central Arnhem Land languages. Unpublished paper.
- 1975b Rembarnga: A Language of Central Arnhem Land. Ph.D. thesis, Australian National University, Canberra.

## MARSH, J.

- 1969 'Mantjiltjara Phonology'. *Oceanic Linguistics* 8/2:131-152.

## MERLAN, F.

- 1976 Linguistic report 1976. Unpublished paper (by permission).

## METCALFE, C.D.

- 1975 *Bardi Verb Morphology (Northwestern Australia)*. PL, B-30.

## OATES, L.F.

- 1964 *A Tentative Description of the Gunwinggu Language*. *Oceania Linguistic Monographs* 10. Sydney: University of Sydney.
- 1976 'Muruwari'. In Dixon, ed. 1976:244-249; 342-347; 472-475.

## OATES, W.J., L.F. OATES et al.

- 1964 *Gugu-Yalanji and Wik-Munkan Language Studies*. AAS 2, L1. Canberra: A.I.A.S.

## O'GRADY, G.N.

- 1964 *Nyangumaṯa Grammar*. *Oceania Linguistic Monographs* 9. Sydney: University of Sydney.
- 1966 'Proto-Ngayarda Phonology'. *Oceanic Linguistics* 5/2:71-130.

## O'GRADY, G.N., C.F. VOEGELIN and F.M. VOEGELIN

- 1966 *Languages of the World: Indo-Pacific Fascicle Six*. *Anthropological Linguistics* 8/2.



OSBORNE, C.R.

1974 *The Tiwi Language*. AAS 55, L21. Canberra: A.I.A.S.

PLATT, J.T.

1972 *An Outline Grammar of the Gugada Dialect: South Australia*. AAS 48, L20. Canberra, A.I.A.S.

RIGSBY, B.

1972 Kuuku-Ya'u fieldnotes and tapes.

1976 'Kuku-Thaypan Descriptive and Historical Phonology'. In Sutton, ed. 1976:68-77.

SAYERS, B.J.

1964 'The Phonemes of Coen Wik-Munkan'. In Oates and Oates et al. 1964:51-56.

1976 'Interpenetration of Stress and Pitch in Wik-Munkan Grammar and Phonology'. *PL*, A-42:31-79.

SCHEBECK, B.

1967 Final report on linguistic fieldwork carried out under research grant from the A.I.A.S. from 23rd November 1964 until 31st March 1967. Unpublished paper.

SHARPE, M.C.

1972 *Alawa Phonology and Grammar*. AAS 37, L15. Canberra: A.I.A.S.

SOMMER, B.A.

1972 *Kunjen Syntax: a Generative View*. AAS 45, L19. Canberra: A.I.A.S.

1976 'Umbuygamu: the Classification of a Cape York Peninsula Language'. *PL*, A-47:13-31.

STOKES, J.

1976 Andiljaugwa unpublished fieldnotes.

STREHLOW, T.G.H.

1944 *Aranda Phonetics and Grammar*. *Oceania Monographs* 7. Sydney: Australian National Research Council.

## SUTTON, P.J.

1973 Gugu-Badhun and its Neighbours. M.A. thesis, Macquarie University, Sydney.

1976 'The Diversity of Initial Dropping Languages in Southern Cape York'. In Sutton, ed. 1976:102-123.

## SUTTON, P.J., ed.

1976 *Languages of Cape York*. AAS, RRS6. Canberra: A.I.A.S.

## TAYLOR, P. and J. TAYLOR

1971 'A Tentative Statement of Kitja Phonology'. *Papers on the Languages of Australian Aboriginals*: 100-119. AAS 38, L16. Canberra: A.I.A.S.

## THOMPSON, D.A.

1976 'Kuuku Ya'u'. In Dixon, ed. 1976:208-211; 329-331; 450-452.

## TREFRY, D.

1974 The Theory of Segmental Phonology and its Application to Dieri. Ph.D. thesis, Macquarie University, Sydney.

## TRYON, D.T.

1970 *An Introduction to Maranungku (Northern Australia)*. PL, B-15.

1974 *Daly Family Languages, Australia*. PL, C-32.

## TSUNODA, T.

1974 A Grammar of the Waruṅu Language, North Queensland. M.A. thesis, Monash University.

1978 The Djaru Language of Kimberley, Western Australia. Ph.D. thesis, Monash University.

## TURTLE, N.

1977 'Alyawarra Phonology'. In J. Hudson, ed. *Five Papers in Australian Phonologies: Work Papers of SIL - AAB, Series A*, vol.1:1-56. Darwin: Summer Institute of Linguistics, Australian Aborigines Branch.

## UNIVERSITY OF ADELAIDE

- 1969 *Pitjantjatjara Language Course Lessons 1-4.* (By permission).

## WALSH, M.J.

- 1972- Murinbata fieldnotes and tapes.
- 1976 *The Muɲinypata Language of North-West Australia.* Ph.D. thesis, Australian National University, Canberra.

## WILLIAMS, C.J.

- 1976 *Yuwaaliyaay and Yuwaalaraay Dialects of North-Central N.S.W.* B.A. (Hons.) subthesis, Australian National University, Canberra.
- 1980 *A Grammar of Yuwaalaraay.* PL, B-74.

## WOOD, R.K.

- 1977 'Some Aspects of Galpu Phonology'. *Talanya* 4:24-29.

## WURM, S.A.

- 1972 *Languages of Australia and Tasmania.* The Hague: Mouton.
- 1976 'Accusative Marking in Duungidjawa (Waga-Waga). In Dixon, ed. 1976:106-111.

## YALLOP, C.

- 1977 *Alyawarra. An Aboriginal Language of Central Australia.* AAS, RRS10. Canberra: A.I.A.S.

## ZWAAN, J.D. de

- 1969 *A Preliminary Analysis of Gogo-Vimidjir.* AAS 16, L5. Canberra: A.I.A.S.

