WORK PAPERS OF SIL-AAB

Series A Volume 5

AUSTRALIAN PHONOLOGIES: COLLECTED PAPERS

Editor: Bruce Waters

PREFACE

These Work Papers are being produced in two series by the Summer Institute of Linguistics, Australian Aborigines Branch, Inc. in order to make results of SIL research in Australia more widely available. Series A includes technical papers on linguistic or anthropological analysis and description, or on literacy research. Series B contains material suitable for a broader audience, including the lay audience for which it is often designed, such as language learning lessons and dictionaries.

Both series include both reports on current research and on past research projects. Some papers by other than SIL members are included, although most are by SIL field workers. The majority of material concerns linguistic matters, although related fields such as anthropology and education are also included.

Because of the preliminary nature of most of the material to appear in the Work Papers, these volumes are being circulated on a limited basis. It is hoped that their contents will prove of interest to those concerned with linguistics in Australia, and that comment on their contents will be forthcoming from the readers. Papers should not be reproduced without the authors' consent, nor cited without due reference to their preliminary status.

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The papers in this volume deal with the phonologies of Nunggubuyu, Burarra, Kala Lagaw Ya, Murinbata, and some aspects of the higher level phonology of Walmatjari. Two papers dealing with orthographic decisions are also included.

Five of the papers in this volume are by SIL authors: Glasgow, Kennedy, Street and Hudson, with the Street paper co-authored by Gregory Panpawa Mollinjin. Their papers are herein being made available in preliminary form, and reader's comments would be appreciated by the authors. These papers normally will be further revised and published more widely elsewhere. The other three papers are by non-SIL authors: M. Hore (Church Missionary Society), J. Stokes (Church Missionary Society), and G. McKay (Northern Territory Education Department). With the exception of Graham McKay, the non-SIL authors have had some interaction with SIL personnel in the writing of their papers - usually of a consulting and/or editing nature. For this reason we are pleased to include their papers in this volume.

Michael Hore's paper primarily deals with rules for stress placement and the interaction of stress and length in Nunggubuyu. He is able to show that stress placement is predictable, given the distribution of long syllables. Interestingly, Michael's analysis hangs partly on the analytical decision that Nunggubuyu has a pre-nasalised series of stops - and he shows how this is motivated by the stress analysis. There is a further point of interest to those concerned with the notion of 'simplicity' as a grammar evaluation criterion; Michael shows that the present synchronic facts motivate two rules at quite different points in the cycle; the two rules are very similar, yet neither can be eliminated.

Kathy Glasgow presents the phonemes and morphophonemics of Burarra. Kathy has given considerable attention over the years to the possibility of a geminate versus non-geminate contrast in the stop series, as well as to other issues such as the interpretation of retroflexed sounds. This paper is the fruit of that research. Kathy's analysis places the Burarra orthography within the main stream of Australian phonologies; she rejects the 'geminate hypothesis' (mainly on the basis of mother-tongue speaker's reactions) and expounds a retroflexed order of sounds. In addition, she has divided what previously was analysed as a flapped apico-alveolar stop into a flapped apico-alveolar rhotic, and an apico-alveolar voiced stop. Interestingly, with these changes the segmental inventory is now the same as that in neighbouring languages.

Kathy's second paper deals with the proposed orthography for Burarra
and the factors which influenced the decisions made. It is refresh-
ing to see that Aboriginal people were consulted and felt free to
take initiative in expressing their feelings concerning their own
orthography. It is SIL policy to encourage and co-operate with the
initiatives of Aboriginal people.

Rod Kennedy presents an account of Kala Lagaw Ya phonology (Mabuiag
dialect, Torres Strait). Kala Lagaw Ya is a language of Australian
descent, but heavily influenced by its proximity to the languages of
Papua New Guinea.

Judy Stokes' paper on Anindilyakwa phonology is the fruit of many
years of wrestling with what must be one of the most difficult of
Australian phonologies. Judy gives a good, well documented account
of the segmental phonology of the language. She alludes to the
difficulties of finding a simple and transparent analysis of the
high vowels. This is an area of interest, for it would appear that
Anindilyakwa shares some features of the phonologies of Central
Australian languages - which have labialised peripheral stops and
a tendency to loss of contrast in the high vowels. Velma Leeding
has addressed herself to the problem of the high vowels and
labialised stops in Anindilyakwa, and is currently preparing a
manuscript to be published elsewhere, dealing with these and other
problems. Certainly, from a purely linguistic standpoint,
Anindilyakwa is a most interesting language, and Judy's high quality
work is a welcome addition to the literature on it.

The phonology paper by Chester Street and Gregory Panpawa Mollinjin
is a re-written version of a paper on Murinbata which Chester wrote
shortly after beginning study of the language. The morphophonemic
changes dealt with would be of interest to anyone concerned with the
idea of 'consonantal strength' in Natural generative phonology theory.
Also included is a short dictionary of approximately 650 words.

Joyce Hudson's paper is a short account of some features of higher
level phonology in Walmatjari. It deals with variations of intonational
contours, and the grammatico-semantic parameters which correlate
with such variations. The paper is partly based on text data which
is included in some unpublished manuscripts on paragraph structure
which Joyce wrote several years ago. The references to these texts
have been left in the present paper, in the eventuality that the
paragraph analysis will be published at a later date.

Finally, Graham McKay's paper gives the results of some testing of
the acceptability of the digraph 'ny' as used in many Australian
orthographies.

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Bruce Waters
Volume Editor
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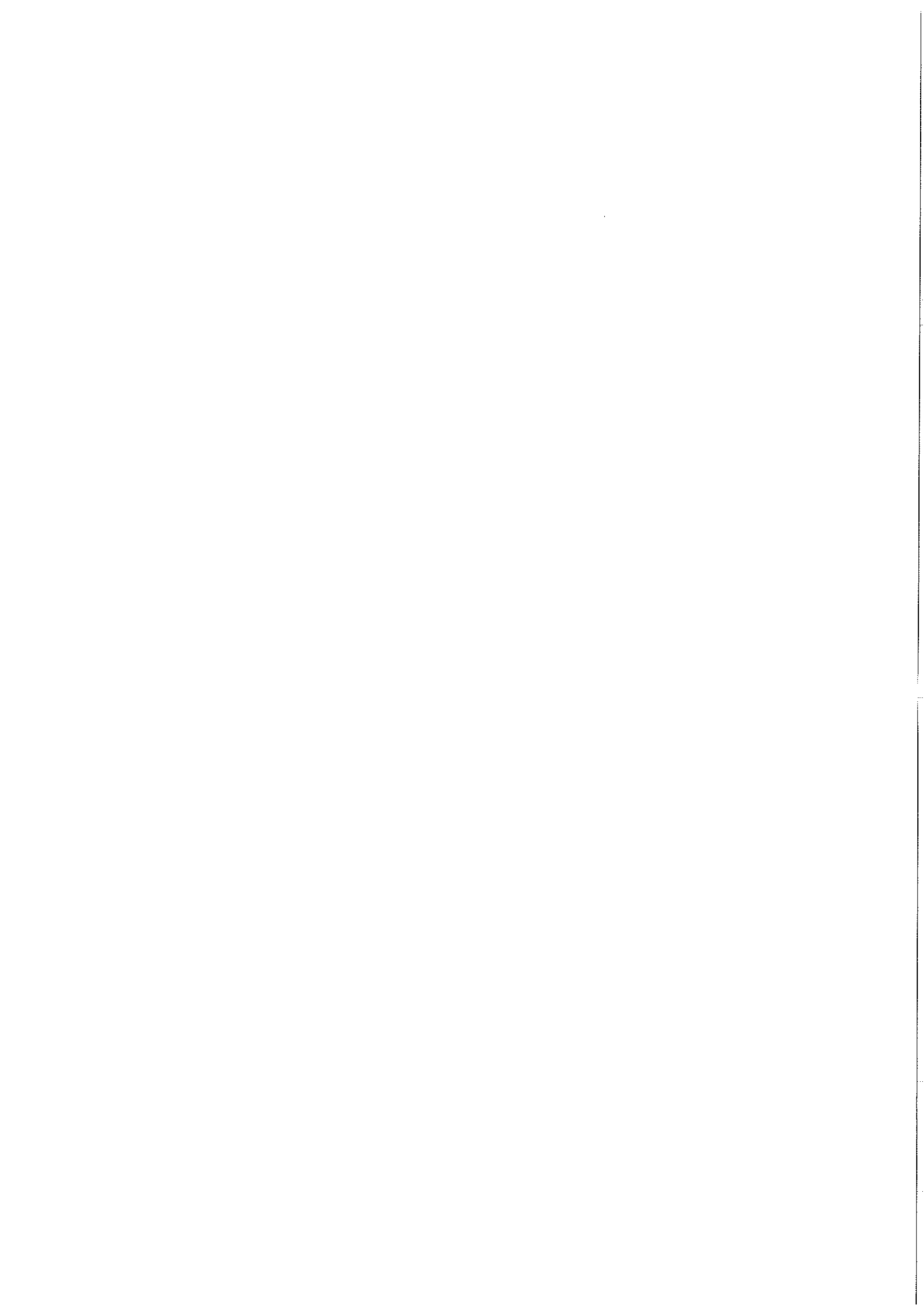
BURARRA PHONEMES

Kathleen Glasgow

0. INTRODUCTION

The Burarra language is spoken by approximately 600 Australian
Aboriginals whose homelands are in the Blyth and Cadell River re-
gions, and who also live at Maningrida. There are three quite close
dialects of Burarra. These may be referred to linguistically as the
Gun-nartpa (Gunadba: Hiatt 1965), Gun-narta and Gun-narda dialects,
according to their respective pronunciations of the demonstrative
descriptive 'that one near you'. The Gun-nartpa homeland is in
the Cadell River area. The Gun-narta group is also referred to as
An-barra, a name which refers to their homeland at the mouth of the
Blyth, on the west. The Gun-narda group is also known as Martay, a
name referring to a group of clans east of the Blyth. Hiatt refers
to the Gun-narta and Gun-narda groups collectively as Gidjingali
(Hiatt 1965), a term (Gu-jingarliya) which the people use in refer-
ring to their language.

Hiatt's map of 'The Gidjingali and their neighbours' (Hiatt 1965) is
reproduced here as a useful summary, bearing in mind that the Burarra
include both Gunadba and Gidjingali. The asterisk on the map is the
location of Maningrida.
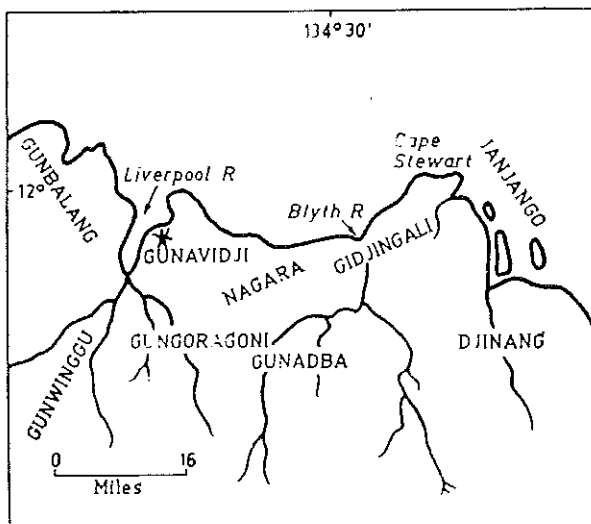
The Gidjingali and their neighbours

1. STRESS

Because stress in Burarra influences the distribution and neutralisa-
tion of phonemes, it is described first. Stress in Burarra is
grammatically predictable. The primary word stress always occurs on
the first syllable of the first root in the word. Where there is
prefixation (including derivational prefixation) and primary stress
therefore occurs word medial, there is a secondary word attack stress.
In compound and reduplicated words a secondary stress occurs, as well,
on the first syllable of the second root. In deliberate or emphatic
speech the primary stress may be postponed to the second root of the
word, in which case the first root receives only secondary stress.

The conjunctions *řapa* 'and' and *řaka* 'and so' are the only words
noted as having no primary stress.

In this paper primary stress is marked by a single quote mark.
Secondary stress is marked in this section, and elsewhere only when
pertinent, by a double quote mark. The following are examples of
stress placement.

'řǐma	'hold it'
"gu'řimaŋa	'he is holding it'
"angu'řimapa	'the owner'
'wola	'long ago'
'wola"wola	'sometime, anytime'
'bala	'house, roof'
'buŋga	'fall down'
ŋu'bala"buŋgabiya/	'my eyelids are drooping'
ŋu"bala'buŋgabiya	

2. THE PHONEMES

Burarra has 21 consonants and 5 vowels.

The consonants consist of 5 voiceless and 5 voiced stops[1], 5 nasals, 2 laterals, 2 rhotics and 2 glides.

TABLE 1

Consonants

	Bilabial	Apico- Alveolar	Apico-Post- Alveolar	Lamino- Palatal	Dorso- Velar
Voiceless Stops	p	t	ṭ	tj	k
Voiced Stops	b	d	ḍ	dj	g
Nasals	m	n	ṇ	ñ	ŋ
Laterals		l	ḷ		
Rhotics		ř	ṛ		
Glides	w			y	

There are 2 high vowels, front and back, and 3 low vowels, front, central and back.

TABLE 2

Vowels

	Front	Central	Back
High	i		u
Low	e	a	o

2.1 CONSONANTS

2.1.1 CONSTRAINTS

The flapped rhotic /ř/ is the only apico-alveolar consonant that occurs word initial, medial and final without constraint. (See section 2.1.4 for examples.) All other apico-alveolar consonants occur only medial and final. Further, the only apico-alveolar consonants other than /ř/ that may occur stem initial following a prefix are /d/ and /n/, and that only as a result of morphophonemic change when preceded by a prefix ending in /n/. (For examples see 3.2.3 and 4.2, example (iv).)

2.1.2 STOPS

The voiced stops, except apico-alveolar (see constraint above), have voiceless allophones which occur word initial. This is evidenced by the voicing which always occurs when a prefix is added. For example:

['palʌ]   /'bala/   → [ku'balʌ]   /gu'bala/
'house'   'in the house'

['ṭawuřdjʌ]   /'ḍawuřdja/   → [tjiñuṛ'ḍawuřdjʌ]   /djiñu'ḍawuřdja/
'play'   'she will play'

['tjaɾʌŋʌ]   /'djaɾaŋa/   → [anʌ'djaɾʌŋʌ]   /ana'djaɾaŋa/
'sand'   'beach'

['kalʌŋ]   /'galaŋ/   → [anʌ'galʌŋ]   /ana'galaŋ/
'hook'   'with a hook'

Note that /g/ tends to have a lenis/soft-fricative quality intervocalically, as is seen in the last example above.

Only voiceless stops occur word final. These have been interpreted as belonging to the voiceless rather than the voiced phonemes.[2] The voiceless stops tend to be unreleased word final, but utterance final this may fluctuate with aspirated release. The voiceless stops occur in any position following the stressed vowel.

The voiced stops except /d/ occur word initial and in all positions word medial. The phoneme /d/ only occurs following /n/.[3]

The voiced and voiceless stops contrast in their mutual environment, that is, word medially in any position following the stressed vowel. The following are examples of voiced/voiceless contrast.

Intervocalic: all vd/vl stops except apico- alveolar	[ˈkɔpɜ]	/ˈgopa/	'keep for self'
	[ˈkɔbɜ]	/ˈgoba/	'pied/magpie goose'
	[ˈyaṭʌ]	/ˈyaṭa/	'for short time'
	[ˈmaḍʌ]	/ˈmaḍa/	'tail'
	[ˈpalatjʌ]	/ˈbalatja/	'hessian bag'
	[ˈpalʌdjɛ]	/ˈbaladja/	'food'
	[ˈpukulʌ]	/ˈbukula/	'forehead'
	[ˈpugulʌ]	/ˈbugula/	'water'
Following nasals: non-apical stops	[ˈtjaɲpʌ]	/ˈdjaɲpa/	type of tree bark.
	[ˈraɳbʌ]	/ˈraɳba/	'thigh'
	[ˈtjamtjʌ]	/ˈdjamtja/	'mother's brother'
	[ˈŋamŋamdjʌ]	/ˈŋamŋamdja/	'taste, test'
	[ˈmɪŋkʌ]	/ˈmiŋka/	'sandfly'
	[ˈdjɪŋgʌ]	/ˈdjiŋga/	'pandanus nut'
Following laterals: non-apical stops	[ˈwɔḷpɜ]	/ˈwoḷpa/	'hunt'
	[ˈwɔḷbɜ]	/ˈwoḷba/	'dragonfly'
	[ˈpaltjʌ]	/ˈbaltja/	'lift up'
	[ˈkuḷdjʌ]	/ˈguḷdja/	'to vomit'
	[ˈpalkʌ]	/ˈbalka/	'to adhere to'
	[ˈkalgô]	/ˈgalgu/	'flying fox'
Following the flapped rhotic: all non-apical stops	[ˈwařpam]	/ˈwařpam/	'completely'
	[ˈwařbululʌ]	/ˈwařbulula/	'pelican'
	[ˈpařtjækʌ]	/ˈbařtjeka/	'to dream'
	[ˈpařdjækʌ]	/ˈbařdjeka/	'to step back'
	[ˈmařkʌ̌]	/ˈmařka/	'try'
	[ˈbařgawʌ̌]	/ˈbařgawa/	'get someone to go with oneself'

Following the retroflexed rhotic: non-apical stops	['wuɽpʌ]	/'wuɽpa/	'sum total'
	['wɔɽbʌ]	/'wɔɽba/	'work sorcery on'
	['yuɽtjʌ]	/'yuɽtja/	'run'
	['wuɽdjʌ]	/'wuɽdja/	'to whistle'
	[a'woɽkiyʌ]	/a'woɽkiya/	'he does habitually'
	['waɽgugu]	/'waɽgugu/	'lonely'

Following glides: non-apical stops	['kaypʌ]	/'gaypa/	'deprive'
	['kuybʌ]	/'guyba/	'to sink'
	['ŋawtjʌ]	/'ŋawtja/	'to yawn'
	['ŋeˡwdjʌ]	/'ŋiwdja/	'to beg'
	['waykən]	/'waykan/	'high'
	['waygədjɛ]	/'waygadja/	'maybe'

Contrasts between the stops of all series may be seen in the following sets of examples, with the exception of apico-alveolar where there are constraints upon it.

Word initial:	*'belabila*	'table'
	'ḍelapa	'child'
	'djel	'ground'
	'gelama	'ear'

Word medial, stressed, syllable initial:	*mungu'beka*	'long stick'
	an'deṭa	'strong one' (see section 2.1.1)
	ŋu'ḍeṭa	'I am strong'
	ŋu'djeka	'I could return'
	guna'geṭa	'dawn'

Word medial, unstressed, syllable initial:	*'gapa*	'there known'
	'gaba	'there unknown'
	'gata	'planetary star'
	'waṭuŋa	'wild dog'

	'ŋaḍawa	'because'
	'gatja	'become dried up'
	'gadjuwuřk	'tinder'
	'wakaḻ	'prawn'
	'wagaṟba	'shoulder'
Word medial following nasal:	*'ŋañbak*	'armlet'
	'banda	'shin'
	'baṇḍa	'freshwater tortoise'
	'bandja	'submerged'
	'raŋgu	'moon'
Word final:	*'ḍař ŋap*	'last one'
	an'maṟbat	'skeleton'
	'mambaṭ	'plate, billy tin'
	an'djambatj	'good hunter'
	'ŋañbak	'armlet'

2.1.3 NASALS

The nasals except /n/ occur word initial, medial and final. /n/ occurs medial and final.

Nasal contrasts may be seen in the following sets of examples.

Word or stem initial:	*'moḻa*	'again'
	'noṇḍa	'mud whelk shellfish'
	gun'ñom	'rectangular one'
	'ŋoḻa	'didjeridu'
Word medial:	*'gama*	'woman'
	'gana	'have eyes open'
	'gaṇaguřdja	'sit down'
	'gañawa	'a yellow seaweed'
	'gaŋaḻa	type of palm with edible fruit

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Word final:	'wařpam	'completely'
	gu'man	'he will probably get it'
	'wuřpaṇ	'emu'
	'bulañ	a subsection of Yirrchinga moiety
	'galaŋ	'axe'

2.1.4 LATERALS, RHOTICS AND GLIDES

The flapped rhotic /ř/ tends to be trilled word final and as the first member of a consonant cluster.

The laterals, rhotics and glides occur word initial, medial and final, except /l/ which occurs only medial and final according to apico-alveolar constraints.

The laterals, rhotics and glides contrast in the following sets of examples.

Word initial:	'ḷak	'to the ultimate'
	řaka	'and so'
	'ṛaka	'sit down'
	'wakwak	'crow'
	'yaguřma	'agree'
Word medial, unstressed:	'maḷawa	'recognise'
	'maḷa	term of address for male of Jowunga moiety
	'mařambay	'pygmy goose', 'adultery'
	'maṛařatj	'a flirtation'
	an'mawuŋa	'his shadow/spirit'
	'ḍulgu	'it's yellow'
	mu'mayana	
Word medial, stressed:	mu'ḷalařdja	'it could dry'
	gu'řawa	'in the place'
	anmu'ṛagalk	'sorcerer'
	guna'waŋařa	'concerning death'

	mu'yalpaḍa	'he's cooking it'
Word final:	*'djal*	'desire'
	'djitjaḷ	'whistle hawk'
	'mar̆	'soul'
	'watpaṛ	type of casuarina tree
	'ŋaw	'yes'
	'bay	'eat it'

2.2   VOWELS

2.2.1   NEUTRALISATION

The 5 vowels which contrast in primary stressed syllables are neu-
tralised in the following ways to a 3-way contrast in secondary
stressed syllables and unstressed syllables.

Word medial in a few reduplicated words, when primary stressed vowels
become secondary stressed (cf. section 1), the low front and low back
vowels neutralise in favour of the high front and back vowels respec-
tively.   In the following examples the primary stressed vowels are
low, and the secondary stressed vowels are high.

    ['pælʌbɪlʌ]   /'belabila/   'table'
    ['ŋɔr̆ŋur̆ʒ]   /'ŋor̆ŋur̆a/   'sleep, day'

Word final in unstressed syllables the vowels /e/ and /o/ are neu-
tralised in favour of /a/, the rounded variants tending to occur in
fluctuation with [ʒ] and [ʌ] where the stressed vowel is rounded, and
the front unrounded variants tending to occur in fluctuation with [ʌ]
and [ʌ̆] where the stressed vowel is unrounded.   For example:

    [pu'r̆ayʌ/pu'r̆ayɛ]   /bu'r̆aya/   'later'
    ['wɔr̆ʌ̆ /wɔr̆ɔ]   /'wor̆a/   'too bad'

Burarra speakers prefer spelling these variants as /a/ word finally.

2.2.2   FLUCTUATION

Fluctuation occurs between full vowel phonemes - sometimes dependent
on the speaker, other times dependent on special speech forms such as
songs.

In some words, /i/ and /u/ fluctuate word medially contiguous to bilabial or dorso-velar consonants. For example:

'wugupa / 'wigipa　　　　　　'together'

'bupudja / 'bipidja　　　　　　'blow'

'gun-ŋa / 'gin-ŋa　　　　　　'what'

'ŋaybuřpa / 'ŋaybiřpa　　　　'we (plural)'

'ařbuřa / ařbiři　　　　　　'to us (plural)'

Note that the word final vowel change in the last example above is explained by the fluctuation of /i/ and /a/ which follows.

The vowels /i/ and /a/ fluctuate in the unstressed syllables of some words when the stressed vowel is /a/. For example:

'waykan / 'waykin　　　　'high'

'baladja / 'balidja / 'balidji　　'food'

'ŋaypa / ŋaypi　　　　　'I'

'waygadja / waygadji　　　'maybe'

2.2.3　INTERPRETATION OF GLIDES

The glide [aᵘ] is interpreted as /aw/. The glides [æˡ] [aˡ] [ɔˡ] and [uˡ] are interpreted as /ey/ /ay/ /oy/ and /uy/ except preceding the lamino-palatal stops or nasal in closed syllables, where the high off-glide is transitional and sub-phonemic. Examples of these interpretations follow.

['ŋaᵘ]　　　　/'ŋaw/　　　　'yes'

['pæˡbʌ]　　　/'beyba/　　　'pass by'

['pambaˡ]　　/'bambay/　　'old woman'

[ʌˇ'bɔˡpʌ]　　/a'boypa/　　'he will go also'

[ʌˇ'guˡbʌ]　　/a'guyba/　　'he could sink'

['ŋaˡñbak]　　/'ŋañbak/　　'armlet'

['kumbaˡtj]　　/'gumbatj/　　'chest'

2.2.4 STRESSED VOWEL CONTRASTS

The five stressed vowels /i/ /e/ /a/ /o/ and /u/ contrast in the
following sets of examples:

'djiřtja	'a water lily'
'djeřdjeřdja	'pour'
'djařtja	'carve'
'djořndja	'pull out of water'
'djuřa	'paper'
'gipa	'already'
guna'gepa	'dawn'
'gapal	'grassland'
'gopa	'keep for self'
'gupa	'build'
'wiřpa	'spill'
'weřa	'bad'
'wařpuṛa	'sorcery item'
'wořa	'too bad!'
'wuřa	'man'

2.2.5 UNSTRESSED VOWEL CONTRASTS

There is no vowel contrast word initial, where only /a/ occurs. The
vowels /i/ /a/ and /u/ contrast word medial and final in the follow-
ing sets of examples, where the vowels being contrasted are under-
lined.

Word medial:	ŋu'buna	'I hit him'
	ŋi'buna	'I hit you'
	ŋuna'buna	'he hit me'
	ŋunabiři'buna	'they two hit me'
	bubuř'boy	'you all go'

	ʹbiřiřdja	ʹstirʹ
	ʹwuřwuřdja	ʹshiverʹ
	ʹwařwařm̃a	ʹtype of catfishʹ

Word final:	ʹguli	ʹanchorʹ
	ʹgola	ʹcataractʹ
	ʹmaṇgi	ʹunderstandingʹ
	ʹmanŋa	ʹjungleʹ
ʹmampa ŋgu		ʹyour motherʹ
	ʹbalŋga	ʹeveningʹ
	ʹgalgu	ʹflying foxʹ

2.2.6 VOWEL ALLOPHONES

The following is a description of the vowel allophones and the environments in which they occur in stressed and unstressed syllables.

/i/   [i]   Voiced high close front unrounded vocoid.
          In unstressed syllables occurs word final, in all positions
          preceding /y/, and immediately pre-stress following /ř/.
          In stressed syllables occurs between /ñ/ and /ñ/, between
          bilabials, and following /ṛ/ when preceding a bilabial.

      [e]   Voiced mid close front unrounded vocoid.
          In unstressed syllables occurs immediately pre-stress
          following /ŋ/ in the prefix [ŋe-] /ŋi-/ ʹI to youʹ, and
          between /ř/ and /p/ in the word [ʹŋařepʌ] /ʹŋařipa/ ʹyou
          and Iʹ.
          In stressed syllables occurs preceding bilabials and dorso-
          velars, and following apico-post-alveolars, either word
          final or preceding apical or laminal consonants.

      [ɩ]   Voiced high open front unrounded vocoid.
          Occurs elsewhere in stressed and unstressed syllables.

/e/   [ɛ]   Voiced mid open front unrounded vocoid.
          In stressed syllables occurs following /dj/ preceding /l/.
          (In unstressed syllables [ɛ] occurs word final as an allo-
          phone of the neutralised vowel /a/.)

[æ̂] Voiced raised low close front unrounded vocoid.
In stressed syllables occurs preceding apico-post-
alveolars.

[æ] Voiced low front unrounded vocoid.
Occurs elsewhere in stressed syllables only.

/a/ [ᶜa] Voiced low open front unrounded vocoid.
In stressed syllables occurs following lamino-palatals
and following /ɽ/ preceding the cluster /ltj/.

[aᶫ] Voiced unrounded vocoid gliding from low open central to
mid open front position. Occurs in stressed syllables
which are closed with /ñ/ or /tj/.

[ʌ̆] Voiced lowered mid open central unrounded vocoid.
In unstressed syllables occurs word final in 2-syllable
stems having the stressed vowel /a/.
In stressed syllables occurs following apical consonants
when preceding dorso-velar consonants.

[ᶜɔ] Voiced fronted low close back rounded vocoid.
In stressed syllables occurs following /w/ when preceding
apico-post-alveolars.

[a] Voiced low open central unrounded vocoid.
Occurs elsewhere in stressed syllables.

[ɨ] Voiced high close central unrounded vocoid.
In unstressed syllables occurs stem final preceding suffix.

[ə] Voiced mid close central unrounded vocoid.
Occurs elsewhere post stress word medial.

[ʒ] Voiced mid close central rounded vocoid.
Occurs in fluctuation with [ʌ] word final following
rounded stressed vowels.

[ʌ] Voiced mid open central unrounded vocoid.
Occurs elsewhere in word final unstressed syllables.

/o/ [ɔ̂] Voiced mid open back rounded vocoid.
In stressed syllables occurs preceding apico-post-
alveolars, following /dj/ when preceding /l/, and follow-
ing /g/ when preceding /m/ or /tj/.

[ɔ] Voiced low close back rounded vocoid.
Occurs elsewhere in stressed syllables.
(In unstressed syllables [ɔ] occurs word final as an
allophone of the neutralised vowel /a/.)

/u/ [ô̂] Voiced raised mid close back rounded vocoid.
In unstressed syllables occurs word final following the
clusters /ŋg/ and /lg/.
In stressed syllables occurs following /g/ /k/ and /w/
when preceding /w/ and /k/, following /ŋ/ or /d̪/ when pre-
ceding /ř̌/, and following /ř̌/ word final.

[ʉ/ô̂] Voiced high open central vocoid fluctuating with voiced
raised mid close back rounded vocoid.
In closed stressed syllables occurs following /g/ or /ŋ/
when preceding /y/.

[ü] Voiced high open front rounded vocoid.
In stressed syllables occurs following /b/ preceding /p/
or /ř̌/.

[u] Voiced high open back rounded vocoid.
Occurs elsewhere in stressed syllables.
In unstressed syllables occurs following bilabials and
following the cluster /ng/ word final.

[ʉ] Voiced high open central rounded vocoid.
Occurs elsewhere in unstressed syllables.
In closed stressed syllables occurs following /m/ when
preceding /n/.

3. DISTRIBUTION

In the examples in this section, a prefix is set off from the stem by
a hyphen, other syllable breaks are shown by a full stop, and stress
is not written.

3.1 DISTRIBUTION OF SYLLABLES

There are six syllable types in Burarra which occur as shown in
Table 3.

TABLE 3

Distribution of Syllables

Word Initial		Word Medial			Word Final	
in prefix	in stem	in prefix	in stem	as suffix	in stem	as suffix
V	V					
C	C					
VC						
CV	CV	CV	CV	CV	CV	CV
CVC	CVC	CVC	CVC		CVC	
	CVCC		CVCC		CVCC	

V syllables occur only word initial in prefixes and in the word *a.ma* 'mother', *o* 'or' (perhaps from English), and in the response forms *e-e* (assent) and *i-i* (emphatic assent).

C syllables occur only word initial as contractions of single CV syllable prefixes preceding homorganic stops and in the word ŋ.*gu.la* 'for you'.

The most common VC syllable is the class marking prefix *an-*. Other VC syllables are in the words *ay* 'yes, what do you want?' or 'what did you say?' and *aywa* 'is that all right?'.

CV syllables occur in all positions. As many as four CV syllables may occur in the prefix and four in stems. Except for the aspect suffix *-n* (probability) which joins the last syllable of the stem to become C_2 in C_1VC_2, all suffixes are CV syllables, and as many as five may occur on a word.

CVC syllables occur in all positions with some limitations – that is, only one may occur in the prefix and two in the stem. There are no CVC suffixes.

CVCC syllables occur in all word positions but only in the stem, and only one may occur per word except where there is reduplication.

Single syllable words may be CV, CVC, or CVCC.

As many as thirteen syllables may occur in a word,
e.g., *ŋu.na.bi.ři-juř.bu.ṛay.ku.dja.mu.ŋa.ṇa.pa* 'they 2 did not whip
me as the others'. However, such long words are very rare. In a brief
count from various texts, three-syllable words were most common.
Next most common were two, then four-syllable words. Less common in
order of frequency were five, six, and one-syllable words. There was
1 eight-syllable word.

Examples of the syllable types in various positions follow:

V	*a-ma*	'he could get him'
	a.ma	'mother!'
C	*m-ba.ŋa*	'he is eating it'
	ñ-jan.dja (see section 4.1)	'you are taking it'
VC	*an-gu.djař.tja*	'knife (a thing for cutting with)'
CV	*ma*	'get it'
	gu-ma	'he could get it'
	we.pa	'wash it'
	a.wu.ři-ba.ma.pu.na	'they two forgot'
CVC	*djal*	'desire'
	buř-ṛan.gu	'by moonlight'
	wak.wak	'crow'
	a.wuř-djay.wař.ya	'they could all turn their heads around'
CVCC	*golk*	'swag'
	yeřm.ba	'husband'
	an-golm.ba.kolm.ba	'little round one'
	balmařk	'wind'

3.2 DISTRIBUTION OF PHONEMES

3.2.1 IN THE WORD

Word initial the only vowel which occurs is /a/. All consonants occur
except the voiceless stops and the non-flap apico-alveolar consonants.

Word medial all vowels occur in stressed syllables, and /i/ /a/ and
/u/ occur in unstressed syllables. All consonants occur.

Word final only the vowels /i/ /a/ and /u/ occur. All consonants except the voiced stops occur.

3.2.2 IN THE SYLLABLE

The only vowel which may occur in V and VC syllables is /a/, except for a single occurrence each of /i/ /e/ and /o/ as V syllable. These are listed in section 3.1 above.

All vowels occur in CV, CVC and CVCC syllables.

Only /n/ and /y/ may occur as consonants in the VC syllable. (See section 3.1 above for examples.)

All consonants occur in CV syllables.

In CVC syllables all consonants except apico-alveolar stops, nasals and laterals occur as the first consonant. All except the voiced stops occur as the second consonant.

In CVCC syllables all except the apico-alveolar consonants and /ṯ/ /ṉ/ and /ḷ/ of the apico-post-alveolar consonants have been found to occur as the first consonant. As the penultimate consonant, only the laterals, rhotics and /w/ occur. The penultimate consonants may be followed by /k/ /t/ /m/ /n/ or /ŋ/ as the final consonant, and in one instance by /p/ in an adaptation of the English word 'salt' *djolp.*

The distribution of consonants in CVC and CVCC syllables is shown in Table 4 on the following page.

TABLE 4

Distribution of Consonants in Closed Syllables

Consonants	C	V	C	C	V	C	C
p	p		p	p			p
t			t				t
ṭ	ṭ		ṭ				
tj	tj		tj	tj			
k	k		k	k			k
b	b			b			
d							
ḍ	ḍ			ḍ			
dj	dj			dj			
g	g			g			
m	m		m	m			m
n			n				n
ṇ	ṇ		ṇ				
ñ	ñ		ñ	ñ			
ŋ	ŋ		ŋ	ŋ			ŋ
l			l			l	
ḷ	ḷ		ḷ			ḷ	
ř	ř		ř			ř	
ṛ	ṛ		ṛ			ṛ	
w	w		w	w		w	
y	y		y	y		y	

There are constraints upon which penultimate and final consonants may occur together in CVCC syllables. Co-occurrences noted to date are shown in Table 5.

TABLE 5

Consonant Clusters in CVCC Syllables

	p	t	k	m	n	ŋ
l	lp		lk	lm		lŋ
ḷ			ḷk			
r̆		r̆t	r̆k	r̆m	r̆n	r̆ŋ
r̥				r̥m		
w			wk			
y				ym		yŋ

3.2.3   ACROSS SYLLABLE BOUNDARIES

The CC clusters found to occur across syllable boundaries are shown in Table 6 on the following page.

TABLE 6

CC Clusters Across Syllable Boundaries

	p	t	t̪	tʃ	k	b	d	ɖ	dʒ	g	m	n	ɳ	ɲ	ŋ	l	ɭ	ɾ	ɽ	w	y
p	pp			ptʃ	pk						pm					pl					
t	tp				tk																
t̪	t̪p				t̪k																
tʃ	tʃp				tʃk						tʃm									tʃw	tʃy
k	kp			ktʃ							km			kɲ̃						kw	
b																					
d																					
ɖ																					
dʒ																					
g																					
m	mp			mtʃ	mk	mb			mdʒ	mg	mm			mɲ̃	mŋ				mɽ̥		
n	np				nk	nb	nd		ndʒ	ng	nm	nn			nŋ			nɾ̥		nw	
ɳ	ɳp					ɳb		ɳɖ	ɳdʒ	ɳg											
ɲ	ɲp					ɲb			ɲdʒ	ɲg											
ŋ	ŋp			ŋtʃ		ŋb		ŋɖ	ŋdʒ	ŋg	ŋm				ŋŋ						
l	lp			ltʃ	lk	lb	ld		ldʒ	lg	lm				lŋ					lw	
ɭ	ɭp	ɭt		ɭtʃ	ɭk	ɭb		ɭɖ	ɭdʒ	ɭg	ɭm				ɭŋ					ɭw	
ɾ	ɾp			ɾtʃ	ɾk	ɾb			ɾdʒ	ɾg	ɾm	ɾn								ɾw	
ɽ				ɽtʃ	ɽk	ɽb	ɽd		ɽdʒ	ɽg										ɽw	ɽy
w	wp				wk				wdʒ												
y	yp				yk	yb			ydʒ	yg	ym				yŋ					yw	

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The cluster /nn/ occurs only across morpheme boundaries at prefix-stem juncture, e.g. *an-neřa* 'bad one'. And contrary to what one would expect, /ñdj/ also occurs only at prefix-stem juncture, e.g. *ñ-djarlapa* 'you could fix it', while /ndj/ occurs elsewhere medially, e.g. *ṇandja* 'pelican', *a-gandja* 'he took him'. This conclusion is based on the absence of the vowel allophones which typically occur preceding lamino-palatals in closed syllables, e.g. [mitjpʌ/miñpʌ] /mitjpa/miñpa/ 'like', [ˈŋaᵗñbak] /ŋañbak/ 'armlet'. Other than at prefix-stem juncture, /ñ/ only precedes bilabials in consonant clusters.

CCC clusters which occur across syllable boundaries are listed below with examples:

/lk.ñ/	*ñalk.ñalk*	type of fish
/lk.w/	*walk.walk*	'spirit of dead'
/lm.b/	*gun-balm.bařa*	'short one'
/lŋ.g/	*balŋ.ga*	'evening'
/řt.k/	(example excluded as it may be offensive)	
/řk.p/	*ḍiřk.pa*	'put into belt or naga'
/řk.t/	*ḍuřk.ṭuřk*	'bloodwood tree'
/řk.tj/	*an-djuřk.tjuřk*	'greedy one'
/řk.m/	*ṛiřk.miñ*	'cripple'
/řk.w/	*muřk.waŋa*	'short stick for throwing at geese'
/řm.b/	*yeřm.ba*	'husband'
/řn.dj/	*djořn.dja*	'pull out of water'
/řŋ.b/	*guybořŋ.biya*	'snore'
/řŋ.g/	*biřŋ.giya*	'sling dillybag on oneself'
/řŋ.m/	*buřbuřŋ.ma*	'put hand into hole'
/rm.b/	*ŋarm.buwa*	'be quiet!'
/wk.tj/	*yawk.tja*	'to cover or fill in a hole'
/ym.b/	*mu-ḍaym.baŋa*	'wild sugar cane'
/yŋ.g/	*bukuyŋ.gula*	'thresher shark'

4. MORPHOPHONEMICS

The following changes occur in Burarra morpheme boundaries. (In the examples in this section prefixes are set off from stems by hyphens.)

4.1 AT ALL MORPHEME BOUNDARIES

Unstressed vowels are deleted between homorganic nasal plus stop or stop plus nasal, and also between /n/ and /ř/.

mu- + bu → m-bu	'he could hit it'
ŋu- + ga → ŋ-ga	'I could take it'
mu- + biři- → mbiři-	'they 2 to it (*mun-* class)'
(gun-) + balma + baře → (gun-)balmbaře	'short'
a-řika + ŋa → a-řikŋa	'he is crawling'
ŋuna- + řima → ŋun-řima	'he could hold me'

4.2 AT PREFIX-STEM JUNCTURE

(i) The vowel is deleted from the prefix *ñi-* (2nd person singular), except preceding /ŋ/ /l/ and /ř/. Following the resulting *ñ-*, /g/ becomes /dj/, and /ŋ/ and /w/ become /y/.

ñi- + bay → ñ-bay	'you could eat it'
ñi- + ga → ñ-dja	'you could take it'
ñi- + ma → ñ-ma	'you could get it'
ñi- + ñagaṛa → ñ-ñagaṛa	'you have none'
ñi- + yalpa → ñ-yalpa	'you could cook it'
ñi- + ŋima → ñ-yima	'you could paint it'
ñi- + wenga → ñ-yenga	'you could speak'

(ii) Preceding /ḍ/ and /ř/, the *ñi-* prefix becomes *ṇ-*, and following the resulting *ṇ-*, /ř/ becomes /ḍ/.

ñi- + ḍawuřdja → ṇ-ḍawuřdja	'you could play'
ñi- + řa → ṇ-ḍa	'you could spear it'

(iii) When the prefix *ñi-* is a part of a larger prefix complex, the /i/ tends to become /u/ in words having a rounded stressed vowel.

ñi- + *na-* + *bupiyana* → *ñuna-bupiyana*   'you came down'

ñi- + *buřʼ-* + *bona* → *ñuɯuřʼ-bona*   'we all/you all went'

(iv) When stems beginning with /ḍ/ receive a prefix ending in /n/, the /ḍ/ becomes /d/.

an- + *ḍeṭa* → *an-deṭa*   'strong one'

(v) When stems beginning with /řʼ/ receive a prefix of one syllable with /řʼ/ final, the /řʼ-řʼ/ becomes /n-d/.

ařʼ- + *řʼa* → *an-da*   'they could spear us'

buřʼ- + *řʼa* → *bin-da*   'he could spear them'

(vi) When the final /řʼ/ of the prefix *buřʼ-* is involved in the above change of /řʼ-řʼ/ to /n-d/, the vowel of *buřʼ-* also changes to /i/.

buřʼ- + *řʼima* → *bin-dima*   'he could hold them'

(vii) When stems beginning with /řʼ/ receive a prefix of more than one syllable in which the final consonant is /řʼ/, the stem initial /řʼ/ becomes /ḍ/.

aɯuřʼ- + *řʼigiřʼga* → *aɯuřʼ-ḍigiřʼga*   'they could go walkabout'

gubuřʼi- + *řʼana* → *gubuřʼi-ḍana*   'they two nailed it'

(viii) Preceding stems in which the stressed vowel is unrounded and the initial consonant of the stem is apical or laminal, the prefix final /u/ in the syllable /bu/ becomes /i/.

ařʼbu- + *ṇa* → *ařʼbi-ṇa*   'they could see us'

bubu- + *řʼima* → *bubi-řʼima*   'they all/we all could hold you'

ñiřʼbu- + *djena* → *ñiřʼbi-djena*   'they all/we all could search for you'

Compare with the following examples where the stressed vowel is rounded or the stem initial consonant is bilabial or velar.

ařʼbu- + *ga* → *ařʼbu-ga*   'they could take us'

bubu- + *ŋima* → *bubu-ŋima*   'they all/we all could paint you'

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ñiřbu- + *wepa* → *ñiřbu-wepa*   'they all/we all could
                                                     wash you'

ŋunabu- + *djoṭka* → *ŋunabu-djoṭka*   'they all/you all could
                                                     wake me'

gubu- + *djupa* → *gubu-djupa*   'they could extinguish it'

(ix) Intervocalic /b/ in the prefix tends to become /w/ preceding
stems beginning with /b/ or /m/.

ŋubuř- + *boy* → *ŋuwuř-boy*   'let's go'
ñibu- + *ma* → *ñiwu-ma*   'you all/we all could get it'

Compare the following examples where the stems begin with other than
/b/ or /m/.

ŋubuř- + *walagiya* → *ŋubuř-walagiya*   'let's dance'
ñibu- + *goṇḍa* → *ñibu-goṇḍa*   'you all/we all could cut it'

(x) When the prefix *gu-* occurs with a derivational function as part of
the stem following the prefix *an-* and preceding a root beginning with
/ŋa/, *gu-* may become *ŋu-*. This has been noted in the following two
words only.

an-guŋaḷtja / *an-ŋuŋaḷtja*   'white one'
an-guŋařtja / *an-ŋuŋařtja*   'white cockatoo'

(xi) Vowel clusters created at prefix-stem juncture become fused.
There are only two instances of this.

ŋudji + *ama* → *ŋudj-ama*   'my mother'
ŋuna + *aña* → *ŋun-aña*   'my father'

4.3 AT STEM-SUFFIX JUNCTURE

(i) Unstressed stem final /a/ becomes /i/ preceding the suffix *-ya*.

a-wepa + *-ya* → *a-wepiya*   'he is washing himself'
gu-řuma + *-ya* → *gu-řumiya*   'it is breaking itself'

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(ii) When the suffix -*pa* is added to word final /iya/, the resulting /iyapa/ may contract to /iypa/:

a-bamiya + *-pa* → *a-bamiyapa* / *a-bamiypa*   'he also is carrying on his head'

(iii) Stem final /dja/ and /tja/ become /dju/ and /tju/ where the stressed vowel is /u/ and the suffix -*ŋa* is added.

a-yur̪tja + *-ŋa* → *a-yur̪tjuŋa*   'he is running'

a-d̪utja + *-ŋa* → *a-d̪utjuŋa*   'he is full'

(iv) Stem final /dja/ and /tja/ become /dji/ and /tji/ where the stressed vowel is other than /u/ and the suffix -*ŋa* is added.

gu-l̪ir̆dja + *-ŋa* → *gu-l̪ir̆djiŋa*   'it is all clear'

gu-djer̆djer̆dja + *-ŋa* →   'he is pouring it'
          gu-djer̆djer̆djiŋa

a-gal̪adja + *-ŋa* → *a-gal̪adjiŋa*   'he is paddling (canoe)'

a-botja + *-ŋa* → *a-botjiŋa*   'he is spitting'

(v) In words where the stressed vowel is non-front, stem final /a/ becomes /u/ when it is preceded by a bilabial and a suffix other than -*ya* is added.

a-gaypa + *-na* → *a-gaypuna*   'he deprived him'

mu-guyba + *-d̪a* → *mu-guybud̪a*   'it is sinking'

a-gal̪ma + *-na* → *a-gal̪muna*   'he got up'

gu-bor̆wa + *-r̆a* → *gu-bor̆wur̆a*   'he thought about it'

(vi) When the suffix -*r̆a* is added to the word *a-ni* 'he could stay/be', the /i/ may be deleted from the stem and the stress moved to the prefix.

a-ni + *-r̆a* → *a-nir̆a* / *'anr̆a*   'he is'
     (Note: the full form is always written)

(vii) Word final /wa/ when not contiguous to the stressed syllable, may elide following /u/, and the /u/ become /a/ except following dorso-velars.

ŋuluwa / ŋula   'for you'
awuřiñ-beřkuwa / awuřiñ-beřku   'husband and wife'

(viii) Stem final voiceless stops elide when the suffix *-djan* is added, and the suffix initial /dj/ becomes /tj/.

wamut + -djan → wamutjan   (feminine form of a
                                        subsection)

ŋařitj + -djan → ŋařitjan   (feminine form of a
                                        subsection)

godjok + -djan → gotjan   (feminine form of a
                                        subsection)

Note that in the last example the entire final syllable of the stem elides.

[1]The voiced/voiceless contrast may alternatively be described as stop verses geminate stop cluster. This interpretation was employed by D. & K. Glasgow for Burarra in 1967, and is used by McKay (1975) for Rembarrnga, Carroll (1976) for Kunwinjku, Wood (1977) for Galpu, McKay (1979) for Djeebbana and Eather (1979) for Nakkara. However, the voiced/voiceless contrast in Burarra is maintained as a two stop series in the present paper, as it is also for Gupapuyŋu (Lowe 1975) and Djinang (Waters 1979), the languages immediately to the east of Burarra.

The decision to maintain a voiced series of stops and a voiceless series of stops in this paper was finally determined by the preference of a Burarra teaching assistant, who has been receiving some inservice linguistic instruction at Maningrida. When an alternate draft of this paper was being written according to the geminate stop cluster interpretation, he requested a copy. But he said that if he were writing the paper, he would describe Burarra as having both a voiced and voiceless series of stops rather than geminate stop clusters. He felt this way even though he was able to distinguish between phonetic, phonemic and orthographic symbolisation and was aware of the weight of distributional symmetry in favour of geminate clusters. This indicates that Burarra speakers do not have an intuitive feel for geminate clusters, and it is desirable that the description of their language be appealing to the Burarra themselves.

[2]In contrast to the word initial stops, there are no instances of word final voiceless stops which become voiced with the addition of a suffix, thereby indicating a voiced interpretation. Instead, a morphophonemic change takes place, in which the word final stop is elided and the suffix initial stop becomes voiceless (see 4.3(viii)).

[3][d] may alternatively be considered a voiced allophone of /t/ following /n/. However, since it is the voiced stops only of the apicopost-alveolar and lamino-palatal series which occur following nasal, not the voiceless stops, there is reason to interpret [d] as /d/. Note that /d/ may also occur stem initial following a prefix ending in /n/, e.g. *an'dana* 'he could spear us'.

N.B. All references in this paper are given at the conclusion of the following paper, 'Burarra Orthography'.