SYLLABLE PATTERNING AND PHONETICALLY COMPLEX CONSONANTS IN SOME AUSTRALIAN LANGUAGES

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0. INTRODUCTION

Some light is thrown on problems pertaining to the phonemic interpretation of phonetically complex consonants or consonant sequences in some Australian languages by a discussion of a kin problem in a New Guinea Highland language. Darlene Bee in a paper entitled "Usarufa Distinctive Features and Phonemes"[1] offers two solutions to a problem in the phonemics of Usarufa concerning the interpretation of the sequence glottal plus consonant and of long nasals.[2] Solution 1 (Cluster Solution) reads: "... interpret sequence of glottal plus consonant as clusters of two diverse phonemes". Solution 2 (Unit Solution) reads: "... interpret sequence of glottal plus consonant... as single unit phonemes".[3] The phonemes of the two solutions are as follows:

SOLUTION 1 (Unit Solution)	*SOLUTION 2 (Cluster Solution)*
p t k ʔ	p t k ʔ
	ʔp ʔt ʔk
m n	m n
	ʔm ʔn
w y	w y
	ʔw ʔy

In summarising the merits of each solution Bee says that if Solution 1 is followed it gives a simple complimentation statement for seven consonant phonemes and a single glide phoneme (/ʔ/). If Solution 2 is followed it gives an increase in the number of phonemes but "the increase is balanced by an exceedingly simple statement of syllable structure with no problem as to borders. Also, some aspects of morphophonemic change are more easily stated with this

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interpretation".[4] Bee leaves to the objective evaluation of the reader which of the two solutions is to be preferred.

Attention is drawn to Bee's classification of Usarufa phonemes into four classes: Consonants, Vowels, Liquids, and Glides. Consonants described as consonantal plus vocalic minus fill a consonant slot; Vowels described as vocalic plus consonantal minus fill a vowel slot; Liquids, both consonantal and vocalic plus may fill either a consonant or a vowel slot; but Glides, being both consonantal and vocalic minus fill neither a consonant nor a vowel slot. In other words, they are undefined as to C or V class except to say that they are neither. Because it has been left to the reader's choice as to whether glottal plus consonant is a single complex phoneme or a cluster of two diverse phonemes, here too there exists an area which is undefined by CV analysis, not as to class but as to whether there are one or two units. Bee's paper is most valuable in so succinctly exposing this problem of the interpretation of undefined data. It is not always possible to set up a grid from non-suspect C and V patterns into which all data can be fitted on that level of analysis without either forcing it or coming into conflict with other phonemic premises. If, when dealing with undefined data, more than one level of analysis is allowed for, the conflict between two phonemic procedures (that of distribution of phones and phonemes and that of interpretation) is eliminated. If two levels of analysis are accepted for Bee's material, both her Solutions 1 and 2 can be adopted together thus giving the benefit of simplicity of each solution at their respective levels: Solution 1 on the segmental level, Solution 2 on the syllable level.

The procedure is visualised as set out in the following chart:

LEVEL	*DATA*	*PROCEDURES*	*LINGUISTIC CONCLUSION*
Syllable	Etic Syllable	Distribution within CV syllable	Emic Syllables
	↑ CV grid	↑ CV analysis (possibility of some slots undefined)	
	↑	↓	
Segmental	Phonetic Data	Separating and uniting procedures	Phonemes

In applying this procedure to an Usarufa word like ké?ò?kè?ʌ *every kind*, a problem is reached when the sequence ?k occurs, as no non-suspect pattern in the language gives clear indication as to whether this is CC or C or neither; it is an undefined slot. If glottal existed in the language only in such sequences as ?k, the interpretation of such sequences would be clear, but conflict of interpretation arises because of the occurrence of glottal elsewhere in the language in mutually exclusive distribution with the manifestation in a sequence. Diagrammatically the problem and its solution may be represented as follows:

LEVEL	*INTERPRETATION*						*LINGUISTIC CONCLUSION*
Syllable	Of syllables	CV	CV	CV	CV		Syllable units
	CV grid (established on non-suspect data)	CV	CV	(?)V	CV		One undefined slot
Segmental	Of segments	CV ké	CV ?ò	CCV ?kè	CV ?ʌ	*every kind*	Phonemes

This solution suggests that for ease of description the undefined slot be considered as two phoneme units on the segmental level and one syllable unit on the syllable level.[5] It will be noted that the CV grid is set up entirely on non-suspect data. If it can be shown that the questionable slot in the grid is not really questionable, doubt of its interpretation is removed on both the syllable and the segmental level. But while doubt exists an arbitrary either/or decision (one or two) results which at this point in the analysis is neither desirable nor necessary.

Following the above analysis the Usarufa phoneme chart would be as follows:

SEGMENTAL PHONEMES				*SYLLABLE ITEMS*[6]		
p	t	k	?	?p	?t	?k
m	n			?m	?n	
w	y			?w	?y	

We will now proceed to show how such a principle assists

in describing some areas of phonemic analysis in Australian languages.

1. PREDOMINANT SYLLABLE PATTERNS IN AUSTRALIAN LANGUAGES

There are two prevailing non-suspect syllable patterns common throughout Australian languages, CV and CVC. In some languages as Gugu-Yalanji (Cape York) combinations of these two patterns comprise 90% or more of the words of the language. They are the only two patterns noted in other languages such as Yugambe[7] and Walbri[8]. In Chart A examples are listed from fifteen representative languages in which these syllable patterns occur.

2. SYLLABLE CONSONANT/CONTOID FILLERS

In many Australian languages the consonant fillers of these two prevailing patterns manifest certain common characteristics. The characteristics pertinent to the thesis of this paper are here listed. They divide the fillers of the consonant slots into four different consonant types:

(i) The almost universal phenomena of medial clusters of two emic (non-suspect) consonants[9] (C type 1-2).

(ii) But note, some languages manifest etic clusters of three and some of four medial contoids.

(iii) The most common two contoid clusters are stop-nasal or nasal-stop clusters with homorganic clusters (C type 1-2A) occurring statistically more frequently than heteroganic clusters[10] (C type 1-2B).

(iv) The absence of retroflexed oral resonant (usually symbolised /ṛ/ or /r/) word initial[11] with the exception in some languages of just a few words[12] (C type 3A).

(v) The rare occurrence of any retroflexed contoid word initial[13] (C type 3B). Their distribution is similar to that of the retroflexed oral resonant being found usually between vowels or in medial consonant clusters.

(vi) But note, if in a language retroflexed oral resonant may be found word initial, then usually the other retroflexed contoids also occur word initial, but if retroflexed oral resonant does not occur

word initially, so usually neither do other retroflexed contoids.

(vii) The frequent occurrence of retroflexed oral resonant syllable finally[14], usually word finally[15] (C type 4).

3. INTERPRETATION OF HOMORGANIC NASAL-STOP SEQUENCES

3.1. Problems of Interpretation in some languages (such as Gugu-Yalanji)

There is plenty of evidence to show that homorganic nasal-stop sequences are very close-knit in Australian languages. In some languages the question arises whether they function as one unit as in Aranda and as M.C. Cunningham has interpreted them in Alawa[16], or as a sequence of two units. The problem of interpretation arises in languages in which they are part of a sequence of more than two consonants particularly if such sequences occur in only a small percentage of words as in Wik-Munkan and Gugu-Yalanji. In the latter language in about five per cent of words homorganic nasal-stop clusters occur in a medial cluster of three contoids the first member of which is l, r, ř, or y.

EXAMPLES:

wa–l̲m̲b̲–a *log;* yi–ř̲m̲b̲–a *three prong spear;* wa–r̲ŋ̲g̲–u *sleep;* wa–r̲n̲d̲–il *wake up;* wa–y̲m̲b̲–il *soft;* bu–ř̲ŋ̲g̲–uy *snore.*

The question arises whether, to fit the permissible non-suspect sequence of two medial consonants, the sequence patterns as one phoneme or whether it patterns as a sequence of two phonemes. Our initial interpretation[17] of regarding these emically as two separate phonemes in a medial cluster of three consonants forming a third, limited, consonant vowel pattern, CCV (and also CCVC), was somewhat arbitrary though it proved a workable solution as trial literacy showed. (The medial nasal consonant of the cluster was taught as a continuant.)

The following analysis suggests a better solution. It postulates that:

(i) the homorganic nasal-stops are syllable units mb, nd, ŋg, in certain environments. They are symbolised as NS in this paper;

(ii) their structure is complex, manifesting a fusion of two component parts in some environments and so

function as one syllable unit, but in other environments their phonetic components function as two phonemes, m + b, n + d, ŋ + g, symbolised as the /N/ and /S/ phonemes in this paper;

(iii) the component parts of the NS syllable unit both retain their phonemic status when viewed solely on a segmental basis.

3.2. Interpretation in Gugu-Yalanji of the NS Syllable Unit

The postulation of the NS syllable unit in Gugu-Yalanji is based on two non-suspect patterns, CV and CVC, which limit the permissible word medial consonant clusters to two based on the non-suspect pattern of not more than two. Thus in the above contoid clusters of three, the homorganic nasal-stops are interpreted as syllable units mb, nd, ŋg, filling a single consonant slot.

3.3. Binary Nature of the Homorganic Nasal-Stop Phonemes in Gugu-Yalanji

The NS units exhibit complexity in that in some environments their component parts function as separate phonemes. On the phonetic level there are five phones in the homorganic nasal-stop series, N, S, NS, N-(S), (N)-S. On the syllable level three contrasts exist, /N/, /S/ and NS. NS is in phonologically predictable variation with /N/ + /S/ where /N/ is homorganic with regard to point of articulation with /S/. On the syllable level NS fills two different types of syllable slots, a CC consonant slot and a C consonant slot, creating two (with a possible third) type of homorganic nasal-stop sequence as follows:

(i) $N\text{-}S_1$ (CC) type where the nasal fills one consonant slot and the stop another. It occurs except following r, ř, l, or y and the first consonant of a suffix morpheme.

Phonemic Evidence: Based on the non-suspect cluster of two as in gunba *finish*, the mb as in gambi *clothes* patterns as a sequence of two consonants.

Morphophonemic Evidence: Morpheme breaks between nasals and stops suggest the nasal closes one syllable and the stop opens the next. Compare:
bunday *sit*, bun-dan-day *sitting;*
duŋay *went*, duŋan-duŋay *going*.

(ii) NS_2 (C) type where, based on the total permissible sequence of consonants as two, the homorganic nasal-

stop sequence fills one consonant slot. It occurs only following r, ř, l and y or is the first consonant of a suffix morpheme.

Phonemic Evidence: wal–mba *log*, war–ŋgu *sleep*, bur–ŋguy *snore*, way–mbil *soft*.

Morphophonemic Evidence: In the following selection of locative allomorphs, mb and ŋd appear to fill one consonant slot following the CV shape of the majority: -ba, -bu, -ŋa, -ŋu, -mba, -nda, -ndu locative.

Compare buwun–ba *into the boat*, gabay–mba *on the ant bed* (both CV-CVC-CV shape); bana–ŋa *for water*, bambu–ndu *to Bambu* (CVC(C)V-CV shape).

(iii) $N\text{-}S_3$ or NS_3 is postulated as a third type to account for all the data. This type is indefinite. It is unclear whether it is a single of a double consonant because the slot is not clearly defined as to whether it is a single slot or a sequence of two. It occurs other than in the two environments listed above. In a word like waŋguriga *to ask*, there is doubt whether the syllables are wa–ŋgu–ri–ga or waŋ–gu–ri–ga.

Thus NS consists on the syllable level of three allotypes, $N\text{-}S_1$ and NS_2 which are in mutually exclusive distribution, and $N\text{-}S_3$ or NS_3 which is regarded to be in free variation with $N\text{-}S_1$ and NS_2 in a third environment.

3.4. Phonemic Status of Component Parts of the NS Unit in Gugu Yalanji

The component parts of the NS unit both retain their phonemic status even when they occur as NS_2, each component being an allophone of the phoneme in isolation. Where N_1 represents the nasal of NS and N_2 represents other nasals, N_1 occurs only preceding a homorganic stop, N_2 occurs elsewhere. Where S_1 represents the stop of NS and S_2 represents other stops, S_1 occurs only following a homorganic nasal, S_2 occurs elsewhere. Compare:

gambi *clothes*, gami *grandfather*, gaba *rain;*

jaŋga *large stone*, miŋu *hook*, jagal *overflow*.

Structurally NS is similar on a morphological level to morphemes which may be bound or free. For example, the component parts of *I will* fall into separate morphological slots (cp. $N\text{-}S_1$), but in *I'll* they are fused into the one morphological slot (cp. NS_2), though the component *I* still

retains its pronominal status and the component *'ll* retains its verbal status.

In summary, in Gugu-Yalanji there are consonants which operate on two levels:

(i) on the phoneme level nasals and stops function as the phonemes /N/ and /S/;

(ii) on the syllable level the homorganic nasal-stop sequence may manifest itself as a combination of the phonemes /N/ + /S/ or as the syllable unit, NS.

4. INTERPRETATION OF RETROFLEXED CONTOIDS

One of the noted features of Australian languages is the series of retroflexed contoids.[18] Traditionally these have been considered as phonetically simple contoids filling a single consonant slot. This analysis has been supported by the fact that it puts them into a neat series both laterally and laminally, and by the fact that as fillers of a single consonant slot they fit the customary CV patterns of the language.

However, in some Australian languages retroflexion exhibits similar complex characteristics to the homorganic nasal-stop series in Gugu-Yalanji in that it has closely related phonetic features of (a) retroflexion, (b) laminal feature, which often manifest themselves as syllable units but may also manifest themselves as separate components.

4.1. Binary Nature of Retroflexion in Tiwi[19]

In Tiwi the phenomena of retroflexion exhibits both the above phonetic characteristics and like the homorganic nasal-stops in Gugu-Yalanji fills, according to different environments, both a one consonant slot and two consonant slots on the syllable level. However, in Tiwi non-suspect clusters of three consonants occur which allow all of the retroflexed series to fit into two consonant slots. In other languages such as Nyangumarda and Wailbri (see Chart E) it is necessary to postulate the retroflexed series as syllable units since these languages have no larger clusters than two non-suspect consonants.

In the following argument, R_1 represents retroflexed oral resonant, RL represents retroflexed contoids. RL consists of the following phonetic features: R - feature of retroflexion; L - laminal feature which has three different manifestations: Ls, a feature of complete stricture; Ln, a

feature of nasal release; Ll, a feature of lateral release. On the phonetic level there are five phones in the retroflexed contoid series: R, L, RL, R(L), (R)L. On the level of contrast and mutually exclusive distribution these form three phonemes: /R/, /L/, /RL/[20] as follows:

/R/ *phoneme:* The feature of retroflexion R is a sub-member of the retroflexed oral resonant R_1, R occurring only in association with L (Ls, Ln, Ll), R_1 occurring elsewhere.

EXAMPLES:

wurta *they;* arnapa *wait;* parlini *old;* (cp. aripa *right side;* kuriwa *morning*).

/L/ *phoneme:* Each of the three elements of the laminal feature L (Ls, Ln, Ll), is a sub-member of each of the following phonemes, /t/, /n/, /l/, respectively, occurring in mutually exclusive distribution with them as follows: Ls, Ln, Ll occur only in association with R, /t/, /n/, /l/ occur elsewhere.

EXAMPLES:

wurta *they* (cp. yati *one item, masculine);* ta:birni *yesterday* (cp. miŋani *now);* parlini *old* (cp. tulguli *bitter*).

/RL/ *phoneme:* This phoneme is postulated as follows: /RL/ contrasts with /t/, /n/ and /l/.

EXAMPLES:

yarti *earth,* yati *one item, masculine;* tabirni *yesterday,* bamagabamini *wide;* parlini *old,* ta:liki *tongue,* kalitaři *ear.*

/RL/ also contrasts with /R_1/. Because no contrast exists between RL and R_1L, RL may be regarded as R_1L since the consonant R_1 is a feature of the language.

In practical application the postulated phonemes pertinent to the retroflexed series in Tiwi are: /t/, /n/, /l/, /r/, /rt/, /rn/, /rl/. These are similar to the phonemes pertinent to the prenasalised stops in Gugu-Yalanji. They are similarly structured and their functional load is similar.[21]

5. OBJECTIONS TO ANALYSIS

The main objections to regarding retroflexion as a complex phoneme are:

(i) it does not fit the CV patterns of the language as well as the traditional analysis of regarding it as

a phonemically simple phoneme;

(ii) /r/ being a weak semi-vowel is not likely to influence stronger phonetic features such as stop and nasal contoids.

6. DEFENCE OF ANALYSIS

6.1. CV Patterning

It has already been shown that medial clusters of two consonants is a common feature of Australian languages and that the most usual place for the occurrence of retroflexion is intervocalic. Thus the interpretation of a medial retroflexed consonant as rt, rn, rl, fits the pattern of the non-suspect consonant sequence of two established in other words in the language. In Tiwi, [paḷini] *old* interpreted as /parlini/ fits the CVC-CV-CV patterning of words like /tulduli/ *bitter*, /girdjini/ *small*. It has been stated that Tiwi has only two CV patterns, V and CV and consequently no consonant clusters.[22] But there is plenty of evidence that consonant clusters exist though not as extensively as in many other Australian languages, as the following evidence demonstrates:

(i) there are non-suspect sequences such as rŋ, lg as in yir'ŋani *lagoon*, tu:l'gu:li *salt*.

(ii) there are reverse sequences as kŋ, ŋk; tr, rt as in irk'ŋa:ba *mouth*, anaŋkwa *not*; trumura'gini *fast*, kuluwarti *dirt*.

(iii) there are prenasalised heterorganic stops: am'dia *and*, yawrabu'řandji *smooth*.

(iv) stress occurs between the nasal and stop in both homorganic and heterorganic stop-nasal clusters indicating the nasal closes one syllable and the stop opens the next: am'dia *and*, ŋerařiŋ'kiti *bite*, kin'daŋa *foot*.

6.2. Patterning of /r/ in Non-retroflexed Stop and Nasal Sequences

Further evidence in Tiwi that the retroflexed series pattern as a sequence of two phonemes is the occurrence of the /r/ phoneme in clusters with stops and nasals other than alveolar. Thus the interpretation of the retroflexed consonants as rt, rn, rl fits a gap in the patterning. Compare

ara'ri<u>rp</u>a *right*, udu'wa<u>rt</u>a *hunt* (both patterning V-CV-CVC-CV); gi<u>rd</u>jini *small;* i<u>rg</u>iritja'pe:ya *count;* ka'ruina<u>rn</u>'gedi *tabu;* mbi<u>r</u>'<u>n</u>aři *fight.* Similar features occur in Burera (Arnhem Land) which has permissible sequences of two initially, medially and finally and the occurrence of such sequences as rr, rp, rk, suggesting the retroflexed series also fit this pattern. In an unpublished paper Glasgow has so interpreted the retroflexed consonants.[23]

6.3. Morpheme Boundaries

Whilst it is not necessary that syllable boundaries be congruent with morpheme boundaries it is awkward to postulate morpheme breaks through a consonant. The archaic form of the Tiwi masculine morpheme -ti is suffixed to stems ending either in a vowel or the phoneme /r/. When -ti is suffixed to a pronoun ending in r, the resultant phonetic form is the common Australian retroflexed contoid [ṭ]. The element of retroflexion belongs to the stem morpheme and the laminal element to the suffixial morpheme. Though structural pressures may suggest the retroflexed consonant is a single consonant /ṭ/, other pressures strongly suggest that the two basic phonetic features of which it is composed should not be submerged.

EXAMPLES:

-ti *suffixed to* r		-ti *suffixed to a vowel*	
mur-ti	*son*	mari-ti	*rainbow snake*
miyar-ti	*pandanus*	ila-ti	*knife*
kuluwar-ti	*dirt*	kulu-ti	*axe*
yar-ti	*ground*	ya-ti	*one item*[24]

This particular feature has been noted by other linguists in other languages; Dr von Brandenstein has noted its occurrence in Jindjiparndi and Ngarluma.[25]

6.4. The Stability of the /r/ Phoneme

The following evidence is put forward to show that (i) in Australian languages the linear division of alveolar is unstable, and (ii) that the /r/ phoneme exhibits many characteristics of stability.

(i) The instability of phonemes in the alveolar region is demonstrated by the fact that it is a common feature in Australian languages for t to be drawn to the alveopalatal position tj contiguous to i, or to be drawn to the point of articulation of a contiguous consonant. For example, the Tiwi word

/tirti/ is phonetically [tjiṭi], *bad*. In Western Desert, the alveolar consonant of the locative and transitive verb suffixes changes its point of articulation according to the final consonant of the stem to which it is suffixed: -ta and -tu become -la and -lu when suffixed to a stem ending in a lateral, -ṭa and -ṭu when suffixed to a stem ending in a retroflexed consonant, etc.[26]

(ii) The stability of the /r/ phoneme is demonstrated by the fact that it frequently influences alveolar phonemes to the retroflexed point of articulation as cited above. This phenomena is seen particularly in the case of the homorganic nasal stop sequence; ṇḍ and nd are both common sequences but ṇd and nḍ do not occur. Retroflexion thus exhibits greater stability than the alveolar feature. We have already noted in Tiwi how the consonant t of the masculine suffix is changed to the point of articulation of the /r/ phoneme following stems ending in r. In Gugu-Yalanji the /r/ phoneme is very restricted, occurring always as a syllable final feature except for one example in 1000 words. Retroflexion is not a feature of the language except for a few words like warṇḍil *wake up* and muṛṇi *to twist* where it occurs in association with the /r/ phoneme in its usual syllable final position. Had the alveolar phonemes been the more stable elements as one would expect, these words would have been phonetically [warṇḍil] and [muṛṇi].

6.5. Retroflexion of Vocoids

It is a common feature in Australian languages that vocoids are retroflexed before a retroflexed contoid but not following one. Douglas draws attention to this feature in the Western Desert language in the pronunciation of such words as [maṇa] *buttocks*, [maḷangka] *at the rear*, and [waṭa] *tree*,[27] as does O'Grady in Nyangumarda in such words as [yuḍa] *fish*, [tyuṇṭu] *heap of sand*, [taḍad] *moon*.[28] This indicates that retroflexion is more particularly associated with a precontoid feature and indicates that the element of retroflexion is not centred in the contoid else it would be reasonable to expect retroflexion of the vocoid following as well as preceding. The centre of retroflexion appears to lie rather in the /r/ phoneme which is manifested as a precontoid feature.

6.6. Rarity of Word Initial Retroflexion

Investigators appear to have difficulty in recording initial retroflexed consonants. The difficulty may reflect actual fluctuation in this region but it is significant that word initial contrasts are rarely if ever listed in the retroflexed series. All such contrasts in languages such as Gunwinggu, Burera, Western Desert, Wailbri, Tiwi are recorded in the word medial position. This fact adds weight to the feature already discussed that the /r/ phoneme has strong preference for syllable final position (though it does not occur exclusively here). It is worthy of note that when word initial retroflexed contoids occur in a language, the /r/ phoneme may also occur word initially, strongly suggesting a link between the two (see Chart B).

NOTES

1. Linguistic Circle of Canberra Publication, Series A, Occasional Paper No.6, Canberra 1965.

2. The allied problem of the interpretation of long nasals dealt with by Bee is omitted as being unnecessary to the present argument.

3. Page 43.

4. Pages 42-43.

5. This principle is stated in Pike's ***Phonemics*** (University of Michigan Press, 1947), Analytical Procedure IV-J:147-8 where he states that a syllable may have a close-knit sequence of two phonemes on the segmental level which acts in distribution in the syllable like a single simple nuclear phoneme.

6. The term *item* is used to describe a feature of the language which may be non-phonemic such as stress and intonation which are often so described when they are non-phonemic.

7. See: ***A Description of the Yugambe: Dialect of Bandjalang***, Margaret C. Cunningham, Summer Institute of Linguistics (to be published).

8. See: ***Phonology of Wailbri***, K.C. Hansen, Summer Institute of Linguistics (in MS).

9. See underlined clusters in Chart A.

10. In ***Gugu-Yalanji***, in a selection of 618 words containing medial consonant clusters, almost 50% (298 words) were the nasal-stop series and of these 60% were the homorganic clusters mb, nd, ŋg. Kundjen has reverse sequences of all the homorganic clusters: mp and pm; nt and tn, ŋk and kŋ. See ***Kundjen Phonology: Word, Syllable and Phoneme***, B.A. and E.G. Sommer, Summer Institute of Linguistics (to be published).

11. The /l/ phoneme behaves much like the /r/ phoneme in this and other respects.

12. See Chart B.

13. /l/ is also usually a syllable final phoneme.

14. See Chart A.

15. See Chart A.

16. Discussion in private correspondence. Material not yet published.

17. ***Gugu-Yalanji Phonemes***, William and Lynette Oates, Occasional Papers in Aboriginal Studies No. 2, Australian Institute of Aboriginal Studies.

18. See Chart C.

19. Examples quoted in this paper have come from the following sequences: own transcription of tapes the property of Dr Helen Wurm, Australian Institute of Aboriginal Studies, and two MS. papers, ***Changes in Tiwi Language***, Arnold R. Pilling, Wayne State University, and ***Tiwi (or Woruŋuwi) Grammar***, author unknown.

20. See Chart D.

21. See Chart E.

22. Statement from ***Tiwi (or Woruŋuwi) Grammar***.

23. ***The Phonemes of Burera***, David and Kathleen Glasgow, Pacific Linguistics, Series A - Occasional Papers, No. 10, Papers in Australian Linguistics No. 1; 1967; pp. 1-14.

24. Examples from Pilling's MS. pp. 5-6.

25. In a report to the Australian Institute of Aboriginal Studies.

26. ***Western Desert Grammar***, W.H. Douglas, pp. 90, 92.

27. ibid, p. 7.

28. ***Nyangumata Grammar***, pp. 6, 16, 12.

Chart A

PREDOMINANT CV AND CONSONANT TYPES

___ = types of emic consonant clusters (C type 1-2) including types of heterorganic nasal-stop clusters (C type 1-2B)
( ) = homorganic nasal-stop clusters (C type 1-2A)
* = syllable final /r/ (C type 4)

LANGUAGE	CV *SYLLABLES*	CVC *SYLLABLES AND* C *TYPE 1-2A*	CV-CVC *COMBINATIONS*
Gugu-Yalanji (Cape York)	ba *come here* ga-ba *rain* ba-da-ba-da *at a lower level*	jin-bal-min *ran* (dambal *shoe* nandal *bury* muŋga *hair*)	ŋur*-ma *shadow* bal-ga *talk* bi-lar* *candle nut*
Wik-Munkan (Cape York)	mi-na *meat* ŋa-ka *water*	nan-pal *from then* (kempa *flesh* kantan *thigh* puŋku *knee*)	mal-pa *dance*
Gidabul (Nthn N.S.W.)	ja-li *tree*	kur*-kun *talk* bay-kal	ya-ra-man *horse* kal-ka-li-wa-li-wan *chopping*
Yugambe (Nthn N.S.W.)	ma-li *that* ga-li *this*	dul-gal *dirty* (yugambe *no* barundi *in the creek* guŋgi *in the water*)	di-bir* *plover* mu-li-mir* *up the hill*
Wunggada (Western Desert)	ma-ma *father* ba-da-ba-da *fight*	(Western Desert) (ŋampa *egg* nantura *mulga grass* maŋka *hair*)	nal-ga *quickly* nun-ŋa *woman* ya-ral-ba *red*
Ungaringin (Kimberleys)	pa-na-ru *sandstone* na-ma-la *hand*	bo:r* *handle*	ba-ŋal *bat* mal-ŋi-ri *lightning*

(Continued on page 45)

Chart A - continued from page 44

LANGUAGE	CV *SYLLABLES*	CVC *SYLLABLES AND* C *TYPE 1-2A*	CV-CVC *COMBINATIONS*
Nyul-Nyul (Kimberleys)	ŋe *yes*	nem *his eye* ŋab *father* mor*-gol *work* gol-gor* *quiet*	ŋa-ler* *my mouth* wa-ra-gan *eagle hawk*
Worora (Kimberleys)	ma *there* ma-ba *old man*		ka-bal-ba *earth* mal-na-nim *creek*
Kokobera (Gulf)	la *over there* ma-ŋo-ra *under-arm hair*	bib *father* mar* *hand* bun-men *blood* nal-ber* *tongue* (paŋanti *what* paŋgeli *hunt*)	wal-pi *west* bir*-ga-da *smoke*
Aranda (Central Aust.)	ma-ṁa *father* ma-la *female* ka-na-ŋa *two brothers*		tal-pa *mouth*
Wailbri (Central Aust.)	ŋa-ba *water* ma-lu *kangaroo* ga-di-di *mouth*	(njambu *there* pindi *skin* miŋgiri *ant bed*)	nar*-ga *man* mil-ba *eye* dja-ŋan-ba *opossum*
Waramunga (N.T.)	wo-ka *word* gu-na-ba *dog*	guŋ *stick* bul-bul *down* win-bin *break*	mun-gu *belly*
Anyula (Gulf)	ŋa-la *but* ma-la-la *little emu*	nan-kar* *cold* (galamba *forehead* balanda *white man* baridjuŋga *water lily*)	ku-tar*-ku *brolga* na-war*-ki *a soak*
Gunwinggu (Arnhem Land)	ma *get on with it!* ba-le *what*	yag-min *finish*	gun-meg-be *there* ŋa-gar*-me *I have it*
Burera (Arnhem Land)	ma *get it* la-ma *shovel spear*	pol *fire* wat-par* *type oak tree* (pampay *old woman* panta *leg* tiŋka *pandanus fruit*)	ka-la-maŋ *axe* war*-tu-na

(Continued on page 46)

Chart A - continued from page 45

LANGUAGE	CV *SYLLABLES*	CVC *SYLLABLES AND* C *TYPE 1-2A*	CV-CVC *COMBINATIONS*
Gubapwingu (Arnhem Land)	na *what!* ma-la *crowd*	dud *he sat down* bag *it broke*	jul-ŋu *person* bar*-gu *far away* da-ŋal-gu-ŋal *make big fire*

Chart B

DISTRIBUTION OF RETROFLEXION IN SIX REPRESENTATIVE AUSTRALIAN LANGUAGES

LANGUAGE	/r/ *WORD INITIAL*	*RETROFLEXED CONTOID WORD INITIAL*	/r/ *& RETROFLEXED CONTOIDS INTER-VOCALIC OR IN* CC
Tiwi (Bathurst Is.)	None	None	tjirita *little* tarinjiti *stone axe* tabini *yesterday* palini *old*
Gunwinggu (Arnhem Land)	Only a few examples in 1000 words: rowug *all* rednameŋ *nest* ruyi *ripe*	did *moon*	ŋare *I go* gunrurg *cave* -nudmime *keep silent* -ronbu *skin a kangaroo*
Western Desert	A few examples: riru-riru *bull roarer* raka-raka *jaw* rapa *confident*	likara *dry bark* tulku *corroboree* ninti *clever*	waru *fire* wata *tree* mana *buttocks* malu *hills kangaroo* kanpi *fat* tulku *song*
Wailbri (Central Aust.)	None	None	wiri *boy* wana *snake* wa:lu *fire* manilba *hair*

(Continued on page 47)

Chart B - continued from page 46

LANGUAGE	*/r/ WORD INITIAL*	*RETROFLEXED CONTOID WORD INITIAL*	*/r/ & RETROFLEXED CONTOIDS INTER-VOCALIC OR IN* CC
Gugu-Yalanji	One example in 1000 words: runudji *one versed in esoteric knowledge*	None	In just a few words as: murni *to twist* warndil *wake up*
Burera	rakka *sit down* ranka *moon* raman *fluff*	ṭiyama *sp. shell fish* ṇorṇdo *mud whelk shell fish* ḷama *shovel spear head*	tjaṛaṇa *sand* ŋaṛpar *cyprus pine* woṛlo *sibling* tjinkubuṭa *catfish*

Chart C

CHARTS OF PHONEMES OF TYPICAL APICAL-CONSONANT LANGUAGES

LANGUAGE	*Bi-labial*	*Dental*	*Al-veolar*	*Retro-flexed*	*Velar*	*Glottal*
Western Desert	p m w	tj ny ly	t n l r y	ṭ ṇ ḷ ṛ	k ŋ	
Gunwinggu	b m w	dj nj lj	d n l r y	ḍ ṇ ḷ ṛ	g ŋ	?
Wailbri	b m w	dj nj lj	d n l y	 ṇ ḷ ṛ	g ŋ	

(Continued on page 48)

Chart C - continued from page 47

LANGUAGE	*Bi-labial*	*Dental*	*Al-veolar*	*Retro-flexed*	*Velar*	*Glottal*
Nyangumarda	p	t^y	t	ṭ	k	
	m	n^y	n	ṇ	ŋ	
		l^y	l	ḷ		
			r			
	w	y		ṛ		

Chart D

PHONEMES ASSOCIATED WITH RETROFLEXION IN TIWI

LATERAL DIVISION →

LAMINAL DIVISION ↓

	Alveolar	*Retroflexed* /RL/ /ʟ/
Stops	/t/	rt-------ʟs
Nasals	/n/	rn-------ʟn
Laterals	/l/ *in mutually exclusive distribution*	rl-------ʟl /R_1/
Resonants		r

Chart E

CONSONANT SEQUENCES FUNCTIONING AS A SEQUENCE IN ONE ENVIRONMENT AND AS A FUSED UNIT IN FOUR LANGUAGES

	SEQUENCE *(Filling two C slots)*	*FUSED UNIT* *(Filling one C slot)*
HOMORGANIC NASAL-STOP SEQUENCES	CVC-CV	CVC-CV
GUGU-YALANJI	gam–bi *clothes* (cp. gun–ba *finish*) bun–dan–day *sitting* (cp. bunday *sit*	wal–ŋga *to hang* (cp. wal–ŋa *to open*)
RETROFLEXED CONSONANT SEQUENCES	CVC-CV-CV	
TIWI	tir–ti–ta *little* (cp. tul–tu–li *bitter* gir–dji–ni *small*)	
	CVC-CV	
	yar–ti *earth* (cp. CV-CV ya–ti *one item*)	
WAILBRI		CVC-CV
		warl–ba *wind* (cp. yur–na *travelling*)
NYANGUMARDA		kart–ku *river gum* (cp. yar–ti *later on*)

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