Ken Hale working with †Mick Connell Jupurrula at the Hales' house in Alice Springs, 1966-67. Photo by Sara Hale.

4 *The wonders of Arandic phonology*

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1. Introduction[1]

One time ago (as Aboriginal storytellers in western Queensland used to say) there was a linguist trying for the first time to elicit material in an Arandic dialect. I won't say who; it could have been almost any of us who have worked on Arandic. Anyway, this linguist was asking for translations of short sentences, and getting answers like:

[awíjaɳiŋgádʲigatʲìŋwaɳəpɛdʲál̪əma], and [ŋúlaŋùlæjiŋgádʲigəgù̪ruwaɳálpmal̪]

(my transcriptions from years ago; they would probably be changed somewhat now).[2] He (or she, as the case may be) was getting a bit overwhelmed by the torrents of seemingly unsegmented speech, and tried for something shorter. But even a little word like 'big' was answered by [íˈlkwijáɳəŋga]. So, in despair, she (or he) asked:

> "This time, instead of me asking you some words, can you just tell me any short words in your language? Some nice easy short ones for me, and tell me what they mean."
> "[t̪íkijáɳánəbánəm]."
> "Oh, that's too long for me!"
> "Too long still, eh?"

And so on.

1 This article is based to a large extent on Breen (1988), a paper presented to the Central Australian Linguistic Circle, part of which formed the basis for Breen (1990) and Breen and Pensalfini (1999). It owes much to Ken Hale's inspiration and ideas, and to ideas from colleagues, especially John Henderson, during many hours of discussions spread over many years. Many others, including, of course, numerous speakers of Arandic languages, most now deceased, could be mentioned given unlimited space. I have had many useful comments on the paper from Harold Koch (who nevertheless would disagree with some of my major ideas), Jenny Green, Barry Alpher, and David Nash.

2 I am using raised 'j' to denote lamino-alveopalatal articulation, subscript hollow dot for retroflexion, and acute and grave accents for stress.

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Forty years on: Ken Hale and Australian languages, 45–69.
Canberra: Pacific Linguistics, 2001.
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Well, that's the effect the Arandic languages can have on the unwary. It takes time—years in my case—to begin to fully appreciate the beauty of the sounds of Arrernte, or Alyawarr, or Anmatyerr, or whichever one you are involved with.[3]

Now the beautiful sounds of Arandic have become an important focus of phonological theory, and this new attention has sprung from seeds that were sown by Ken Hale. It was Ken who first observed that the Arandic language Kaytetye seemed to have only two vowel phonemes (Hale 1959), and at least one other Arandic communalect, the western variety of Western Anmatyerr as spoken around Mt Allan, seems also to have such an inventory, although there are small doubts in both cases. The study of Arandic phonologies has grown from that observation of Ken's to the present situation where, thanks to the perspicacity of Arrernte speaker Margaret Mary Turner who knew that the play language Rabbit Talk would be interesting to a linguist and set up a meeting for me with two of the last good speakers, Arrernte phonology has been used to overturn one of the oldest universals of linguistics.

The demonstration that the underlying syllable in Arrernte has a coda but no onset has been published (Breen and Pensalfini 1999),[4] see §3.3 for a sample of the argumentation. Other aims are to introduce current notions of vowel inventory and rounding as a feature of consonant positions rather than of individual segments, which, like the idea of exclusively onsetless syllables, can help in the parsimonious description of the diversity of phonology in the Arandic languages.

Traditional Arandic countries are indicated on the map ['Arandic languages and some neighbouring languages']. Note, however, that since white settlement there has been a movement of speakers of Western Desert dialects into the southern and eastern parts of the Arandic area, and an expansion of Arandic (Alyawarr) speakers to the north-east into country formerly inhabited by speakers of now-extinct languages.

The name Arandic used for the language group comes from the early Lutheran missionaries' spelling Aranda of the language name that they now spell Arrarnta and many others spell Arrernte. The retroflexion of the nasal–stop cluster is predictable and some omit it from the spelling. The earliest spelling, Arunta, is perhaps the most suitable for monolingual English speakers. The most authoritative pronunciation is approximately [arə́n̪ d̪ə] although some say [árənd̪ə].

The group includes Western, Central and Eastern Arrernte, Anmatyerr, and Alyawarr (both of which could be subdivided into at least two rather different forms) as varieties still having a substantial number (of the order of 1000) of speakers. These, with other varieties which are extinct or have only a small number of speakers remaining, form a chain of what some linguists regard as mutually intelligible dialects and so constituting a single language, Wilkins (1989:8–14) thinks, however, that because of the substantial sound changes that have affected different communalects in different ways, they should be regarded as four mutually unintelligible languages (Western Arrernte, Eastern Arrernte, Anmatyerr, and Alyawarr). The group also includes another language, Kaytetye, in the north, not mutually intelligible with these, and an almost extinct language, Lower Arrernte (Arrernt Imarnt) which Hale classes, probably correctly, as another separate language. The whole situation needs much more study; for example, it seems clear now that Western Anmatyerr is much

3 See also Green, ed., this volume.

4 This applies Optimality Theory; an earlier unpublished demonstration (Breen 1990) used Prosodic Morphology.

more different from Eastern Anmatyerr than the latter is from (Southern) Alyawarr and (North-) Eastern Arrernte. I will generally use the term 'language' in referring to the various named varieties (although some of them, such as CAr and EAr, are certainly related to one another as dialects of a language), and this will normally refer specifically to languages in the Arandic group.[5]

Major works on these languages are rare, considering their importance and interest to those concerned with Australian languages, but include Strehlow (1944), primarily on Western Arrernte, and Yallop (1977) on Alyawarr. Two large and important theses are Wilkins (1989) and Henderson (1998). Large dictionaries published in recent years are Green (1992) and Henderson and Dobson (1994). Other linguists who have done substantial work on the group (most of it still unpublished) include Avery Andrews, Harold J. Koch, and Myfany Turpin, as well as a number of members of the Finke River Mission and the Summer Institute of Linguistics. A growing number of texts and translations have been published in the more viable dialects in recent years by a number of native-speaker writers, Bible translators, and educators.

2. Phonology of the Arandic languages: general features

The Arandic language group belongs to the Pama-Nyungan family, which includes the languages of all except the far north and north-west of the continent. It shares many of the major phonological features which characterise typical Pama-Nyungan languages: six contrastive points of articulation for stop phonemes, which include two apical (alveolar and retroflex) and two laminal (interdental and alveolar or alveo-palatal); a nasal corresponding to each stop; a lateral corresponding to each apical and laminal stop; no phonemic distinction based on voicing; no fricatives; two rhotics; few vowels. (None of these features is universal in Australia; in particular, a number of languages bordering on the Arandic group have only one laminal series.)[6]

However, the Arandic group has undergone drastic sound changes which give it a phonological structure (and phonetic nature) quite different from that of neighbouring languages.[7] These changes include dropping of the initial syllable (which in most dialects is frequently replaced by /a/), dropping of the final vowel, prepalatalisation of retroflexed consonants and prestopping of certain nasals. One notable result is that, whereas in other Central Australian languages all or most words begin with a simple consonant and none (e.g. in Warlpiri) or a minority (e.g. in Pitjantjatjara) begin with a vowel, in the typical Arandic dialect most words (underlyingly, all words, we believe) begin with a vowel, many begin with a complex consonant or a consonant cluster, and only a small minority begin with a simple consonant.

5 Abbreviations of language names: Aly – Alyawarr; Ant – Antekerrepenh; Ay – Ayerrereng; CAr – Central Arrernte; EAnm – Eastern Anmatyerr; EAr – Eastern Arrernte; Kay – Kaytetye; LAr – Lower Arrernte or Arrernt Imarnt; NAly – Northern Alyawarr [Western Aly]; Per – Pertame or Southern Arrernte; SAly – Southern Alyawarr [Eastern Aly]; WAnm – Western Anmatyerr; WAr – Western Arrarnta or Western Arrernte.

6 A series of sounds belonging to what might be thought of as a seventh point of articulation will be mentioned in several places and in particular discussed in §4.5.

7 Koch (1997) suggests a series of sound changes to account for the present situation. Some of Koch's suggestions are modified by Breen and Pensalfini (1999:9–10).

The most fundamental change, however, involves the vowels. The typical Australian language has a three-vowel system, with /a/, /i/ and /u/. (Many languages also have three corresponding long vowels.) This system is often described as triangular, referring to the description of these vowels as low, high front, and high back. For many Australian languages, however, it seems more profitable to think of the distinction between /i/ and /u/ as being one of palatal versus labio-velar or unrounded versus rounded rather than front versus back, and the term 'triangular' is not so appropriate.

In the Arandic languages, it appears that what has happened is that the roundness feature has become associated with consonants rather than with vowels. It is common in Australia for a rounded vowel to induce non-phonemic roundness in the following consonant, especially if a velar; for example, /yuka/ 'water' in Wakaya is [juk^{w}a]. If the roundness were to become thought of more as a feature of the consonant than of the vowel, and the initial syllable were dropped, the result would be a word *kwa*, with a rounded stop /kw/[8] phonemically distinct from /k/—in fact, the word for 'water' in Arandic communalects other than Kay is /ekwaty/, which is probably the result of augmentation of a morpheme cognate with *yuka*, and Kay has the same morpheme in *kwathe-* 'to drink'; see Koch (1997 and this volume).

The result of this, if it applied to all consonants, could be to eliminate the roundness feature from vowels and so, if the original distinction between the two high vowels had been essentially one of roundness versus unroundedness, to cause these two vowels to merge. There would then be a two-vowel system with the distinction one of height. Phonetic rounded vowels would then be due to the effect of a contiguous rounded consonant.

This is illustrated by a comparison of forms in a situation where the environment conditions realisation of the roundness as a clearly consonantal feature as opposed to being merged with the vowel. So, for example, the imperative form of the verb 'to hit' is [atwæ̰j] whereas the present tense is [atúmə] and the past tense [atúkə]. While the two latter forms would suggest a stem /atu/ (on the basis of comparison with other verb stems) the first suggests /atw/. Convincing evidence that the latter is the case is found in reduplicative morphology. For example, habitual nominalisation of a verb, forming a word meaning (among other possibilities) 'the one who habitually does the action' or 'thing used for doing the action', involves suffixation of *-enh* to the verb stem followed by reduplication of the last vowel and consonant or consonant cluster of the verb stem and the *-enh* (and, to conform to an orthographic convention,[9] addition of a final *e*). Examples are in (1):

(1) *an* 'to stay' > *anenh* > *anenhanenhe* 'one who habitually stays somewhere'
mpwar 'to make' > *mpwarenh* > *mpwarenharenhe* 'maker'
altyweril 'to open' > *altywerilenh* > *altywerilenhilenhe* 'opener'

[8] I have used orthographic symbols (including digraphs and trigraphs) for representing phonemes throughout, except in §4.1 and §4.5, where it has been necessary to use some superscript letters to distinguish phonemes from clusters.

[9] In this case, since the examples are taken from Central Arrernte. The final 'e' written on all words in this and some other dialects is (obviously) noncontrastive and (in my understanding of the term 'phoneme') therefore not a representation of any phoneme.

The stem of the verb 'to chase' is [aluŋ̟]; if this is to be analysed as /alurn/ the reduplicated form 'one who habitually chases' would be *alurnenhurnenhe* [alúŋ̟nəŋ̟ʊ̀ŋ̟əŋ̟]; if it is /alwern/ it would be *alwernenhernenhe* [alúŋ̟nəŋ̟ə̀ŋ̟nəŋ̟]. In fact, it is the latter.[10]

In a paper on the phonology of the almost extinct easternmost dialect, Antekerrepenh, Breen (1977) (following a suggestion by Hale) made a case for a two-vowel analysis, with the distinction basically one of length. A two-vowel analysis is no longer maintained except for Kay as analysed by Hale (1959) and Koch (1984:33 note 4 and 1997:274), and WAnm,[11] but other Arandic phonologies are analysed as having two basic vowels and one or two others of restricted distribution. Most of the linguists involved, however, have maintained that the distinction between the two basic vowels is one of height—low versus mid—rather than length (and indeed this feature of his analysis was never argued strongly by Breen). Currently, the nonlow vowel is regarded (by some, at least) as a featureless vowel and the other as having the feature +length.

Since this type of analysis, involving rounding of consonants, has been accepted, consonant inventories have often been described as including a certain number (for example, 26 for CAr) of unrounded consonants plus a rounded consonant corresponding to each unrounded member of the inventory. There are doubts about this, however; roundness seems not to be associated with consonants as such, but with consonant positions in a word—which might be occupied by one or two consonants. Roundness may be manifested either on the onset side or the release side of a consonant or cluster, depending on the nature of the consonant(s) and the environment; the conditioning factors are different for different dialects or idiolects. For example, in EAr there is a change in progress (for certain consonants) from rounded onset in the pronunciation of older speakers to rounded release for younger speakers. Thus older speakers' *utyene* [ʊtʲə́nə] 'sore' corresponds to younger speakers' *tywene* [tʲʊ̀n].[12] In the case of clusters, the change takes place as long as it does not leave in word-initial position a consonant cluster that is not acceptable there. So the older *unte* [ʊ́ndə] or [ʊndá] 'you' becomes *ntwe* [ndwa] because clusters of nasal and stop are permissible initially. On the other hand, a word like *urrpetye* 'a few' is not changed because initial [ɾp] is not permitted. However, although dropping of an initial vowel (another very common change) is not permitted if it leaves in initial position a cluster that is not allowed there, it is permissible if the cluster is rounded and the roundness can be switched from release to onset to provide a phonetic vowel before the cluster. Thus, although initial [ɾp] is not permitted, the initial vowel of *arrpwarne* [aɾpwáŋ̟ᵊ] 'barking' can be dropped and the word is pronounced as *urrparne* [ʊɾpáŋ̟ᵊ].

Also, roundness tends to spread or migrate within a word, although in most dialects it is stopped by a long vowel (/a/ or /i/).[13] See Evans (1995:736–7) for some examples from CAr. A particularly striking example of migration of roundness is the word for 'fig' in Aly,

[10] This test was proposed by Avery Andrews at a meeting in 1981, as an improvement on my test involving another type of reduplication in which *-ep* is added to the verb stem. As he pointed out, /p/ can condition a certain amount of roundness in the following vowel and so obscure the effect. Wilkins (1989:92–3) shows how a third type of reduplication could also be used.

[11] And I do not regard either of these as being beyond doubt.

[12] In this dialect this difference is reflected in the spelling; in some it would not be.

[13] Alyawarr does not always conform to this generalisation; note the pronunciation of *angayakw* 'hungry' as [aŋwájak]. The alternative form *angayel* never has rounding on the first consonant.

which I have recorded as [ʊtʲə́rkə], [tʲʊ́rkə], and [tʲə́rkʷə].[14] A consequence is that it may be difficult (for a nonspeaker at least) to decide the source of the roundness—for example, whether the WAr word for 'white' should be written *tywelkere* or *tyelkwere*. (Native speaker writers differ on this matter, perhaps simply because their own pronunciations differ.)

If a cluster (at least in any of the southern varieties of Upper Arrernte) is heterorganic and is preceded by /e/, the rounding is realised on the onset. Examples for CAr are *urlpe* 'red ochre', *arrurrkeme* 'rustling', *akerturrpe* 'short cut'. However, there are a handful of exceptions, as Henderson (1998:23) points out. He gives two examples, *ahelkngwe* 'a grave, a pile of dirt from digging' (*ahulknge* for some speakers) and *atenkwelknge* 'snot' (*atengkwelknge* for some speakers). These can probably be explained away: *ahelkngwe* is probably a compound of /ah/ (as in *ahelhe* and *aherne*, both 'dirt')[15] and *ilkngwe*, which has the same meaning as *ahelkngwe* and in which the rounding could not be realised other than on the release. *Aten(g)kwelknge* would be a compound of *ate* 'lump of dirt' and **ngkwelknge*, which would be an earlier word meaning 'snot' (cognate with WAr *ngkwalknge*). WAr has a similarly small number of exceptions, which likewise can be explained away—for example, two of them are onomatopoeic bird names whose form suggests reduplication and reduction.

Like the similar glide in Warluwarra (Breen 1971), /h/ is thought to descend from */k/[16] although few cognates can be found: Breen (1988) suggests Wangka-Yutjurru *wakirra*, Arandic *(a)herr(e)* 'kangaroo', and Pitjantjatjarra *pika*, Arrernte *ahe* 'angry', while Koch (1997:278–79) suggests proto-Pama-Nyungan **Raaku* > Arrernte *ah* (in *aherne* and *ahelhe*) 'earth'. In certain affixes in NAly and WAnm (see §§4.3 and 4.7) /h/ is cognate with /k/ in other Arandic varieties and in the 'Common Australian' suffix *-ku* (Capell 1956).

The consonant inventory for CAr is as tabulated below (using orthographic symbols). The minor differences in some other dialects will be mentioned in later sections.

Table 1: Central Arrernte consonants

	peripheral		laminal		apical	
	bilabial	velar	dental	alveolar	alveolar	post-alveolar
stop	*p*	*k*	*th*	*ty*	*t*	*rt*
nasal	*m*	*ng*	*nh*	*ny*	*n*	*rn*
prestopped nasal	*pm*	*kng*	*thn*	*tny*	*tn*	*rtn*
lateral			*lh*	*ly*	*l*	*rl*
tap					*rr*	
glide	*w*	*h*		*y*		*r*

14 In the orthography used for Alyawarr, the first two of these would be spelt *tywerrk* and the third *tyerrkw*.

15 Harold Koch (pers. comm.) suggested this improvement on my original etymology, which had *ahelhe* as the first element of the compound.

16 An earlier suggestion (see Breen 1977) was that it was from */w/ between unrounded vowels, and that /w/ is the rounded counterpart of /h/. The latter proposition is not consistent with phonetic data that show that roundness associated with other rounded consonants has a substantially greater effect on surrounding vowels than does the roundness of /w/.

3. Phonological notes on Central and Eastern Arrernte

3.1 Central Arrernte

This is often called Eastern Arrernte, which name is also variously used by different groups for Central and Eastern (as used here) together, for the form of Central Arrernte spoken by people originating to the near east of Alice Springs, and for the language referred to herein as Antekerrepenh.

Phonological research on CAr in the late '70s was directed towards the development of a workable orthography rather than an in-depth understanding of the phonology. The orthography developed in 1978 and approved, with a minor change, at a meeting of Arrernte speakers, linguists, and others in 1979, used three vowels, *a*, *e*, and *i*. This was not intended at that time to imply abandonment of the two-vowel analysis (which had been suggested for Kay (Hale 1959) and developed independently—although following a suggestion by Hale—for Ant (Breen 1977)), but a concession that it might be a little too abstract in some aspects for an orthography. (The two-vowel analysis was, however, abandoned some time later, for reasons briefly summarised in §4.1.) The orthography implied rounding associated with consonant release, symbolised by a *w* following the consonant symbol, as in *akweke* [akúkə] 'small', and also rounding associated with consonant onset, symbolised by *w* preceding the consonant symbol, as in *ewre* [úɹə] 'fire' and *kewrne* [kóɳə] 'bad'. This orthography was later changed by substituting *u* for *ew* before a consonant. This change again was not intended to imply a change in the phonological analysis; however, there are some reasons related to phoneme distributions for preferring an analysis with a fourth vowel, /u/. On the other hand, similar reasons could be invoked for an analysis using pre-rounding but without an initial vowel when the pre-rounded consonant is the first consonant of the word (with 'fire' written *wre*, for example). A natural development from this was to regard a consonant with pre-rounding as just another manifestation of the same underlying form as the same consonant with post-rounding (so 'fire' would be *rwe*).

A reason for reluctance to accept this analysis for CAr (but not for some of the other languages) is that most speakers would stress the initial rounded vowel of a short word like *ure* 'fire'. However, to disprove it one must find a contrast between [əC] and [əC^{w}] or between [#C] and [#C^{w}]. One possibility is the contrast between *utepe* [utə́pə] 'back (as in turn back)' and *tweme* [tʊ́mə] 'hitting' if the latter is accepted as a valid form and not just a variant pronunciation of *atweme*. If it is the latter, it is the underlying /a/ that prevents its being changed to *uteme*. Many speakers do use *atweme*, at least sometimes, while others who do use *tweme* reduplicate it to *twepatweme* (with medial /a/ reflecting underlying initial /a/) rather than *twepetweme*. The contrast does seem to exist for those speakers who say *tywepmare* for '(finger or toe)nail' and *utyerrke* for 'fig tree'; more conservative speakers mostly say *tyepmware* and *utyerrke* while younger speakers mostly say *tywepmare* or *tywemare* and *tywerrke*. A contrast that seems to exist for a large number of speakers is that between *utyerrke* and *tywerrenge* 'sacred object', but some older speakers, especially of the Eastern dialect, say *atywerrenge*. The form *tywerrenge*—the normal form in some dialects—has been borrowed into English (with spellings churinga or tjurunga), and this may have influenced speakers against the vowel-initial form. Other words with initial *tyw* include loans from English such as *tyweketyweke* 'chook, fowl' and *tyweke* 'sugar', and perhaps a few less well-known words like *tywetalpe* (a species of bird). The contrast between *yweke* 'I

don't know' (some say *yekwe*)[17] and *uyerreme* 'disappearing' (younger speakers say *ywerreme*) also is relevant; there seems to be little or no other evidence of this sort involving consonants other than /ty/. The contrast seems, therefore, to exist only in a transitional stage between a situation in which an onset rounding vowel is favoured word-initially and a situation in which rounding of the release of an initial consonant is favoured.

The analysis in which pre-rounding and post-rounding are regarded as just two noncontrastive aspects of the one phonemic situation is therefore supported not only by the situation in other dialects but by the changes that are occurring in young peoples' speech (see above). However, the analysis (as proposed, for example, by Wilkins 1989) with a vowel /u/, which, like /a/ and /i/ is [+long], is supported by a few words such as *arrutne* 'chin', *arrule* 'long ago', and *arrurre* 'corella (bird)' because of a rule which disallows a sequence apical consonant—vowel—alveolar consonant except when the vowel is long.[18] If the vowel is short (/e/), the second consonant in such a sequence becomes retroflexed (and /rr/ becomes /r/).

A phonetic feature of CAr is that 'retroflexed' consonants are usually prepalatalised after /i/ and often also after initial /a/ or after stressed /a/ when a heterorganic consonant follows. Such prepalatalised consonants may be pronounced without retroflexion. The division of the two apical series into an unmarked and a marked series—say unmarked and retracted—may be more appropriate than division into alveolar and retroflex or postalveolar. However, it is not at all clear which series is in fact to be regarded as unmarked. Prepalatalised consonants contrast with both alveolar and retroflex in some languages; this will be discussed below, especially in §4.5.

It seems that a type of sequence that may have formerly existed, perhaps as an alternative to clusters of prepalatalised nasal or lateral and stop, is a cluster of palatal nasal or lateral plus stop. Conversely, prepalatalised first members of clusters may have alternated with what are exclusively palatals now. There are a few examples in Hale's comparative wordlists. For example, he gives the word for 'ear' as /ilyp/ in Kay, (Central) Arrernte, and (Western) Anmatyerr, and as /iylp/ in NAly, SAly and EAr. There are three other examples involving lateral and /p/, one involving a velar stop (/iylkw/ in the two Aly lists, /ilykw/ in Arrernte 'armpit'), one with a prestopped nasal (/uylpm/ in SAly, /ulypm/ in EAr and CAr 'language') and one with a nasal (/aytnp/ in Kay, /aynp/ in Aly, /anyp/ in CAr 'pouch'). I have similar examples from different Ant speakers. There are a couple of words with /lyp/ in Henderson and Dobson. For Kay, Koch's early spellings show /lyp/ contrasting with /lp/, /rlp/, and /ylp/, but he (pers. comm.) now strongly doubts that it has palatals contrasting with prepalatalised consonants before a heterorganic consonant. No heterorganic palatal + stop clusters are now written in the Kay orthography. However, it seems that such clusters existed and still exist, at least marginally, in some languages.

Rounded consonants usually have a clear rounded off-glide when they are in word-final position or before /a/ or /i/; before /e/ this is not usually detectable, the rounding being realised as roundness in the following vowel (or vowels).

Pronunciation of the vowels is, briefly, as follows:

/a/ is a low unrounded vowel, rather long when stressed but otherwise short. It is affected very little in quality by neighbouring consonants; an exception is that it is raised and fronted when followed by a prepalatalised allophone of a retroflexed consonant or by /y/ in certain

17 Henderson (1998:46–7) regards [júkɐ]—my *yweke*—as a realisation of *yekwe*.

18 John Henderson drew my attention to the relevance of this rule to this problem.

stressed environments, for example, when /ay/ is used as a vocative suffix or to mark imperative on a verb. A 'minimal pair' is *alaye* [alá˙j] 'sea' and *alaye* [alǽj] 'look out!' (an exclamation).

/i/ is a high-front vowel, ranging from [ɪ] to [i] to [ɛ] in quality and lengthened when stressed. Its quality is determined by the nature of the following consonant; it is low when followed by an apico-alveolar, especially /rr/, high when followed by a retroflex (which becomes prepalatalised) or lamino-alveolar, and intermediate before other consonants.

The quality of /e/ is determined by the nature of the surrounding consonants. In a 'palatal' environment (i.e. preceded or, especially, followed by a lamino-alveolar, especially /y/) it is raised and fronted; in a rounding environment it is raised and rounded; before a retroflexed consonant it is retroflexed; in a 'neutral' environment (involving none of the foregoing consonant types) it is central or low and unrounded.

/u/ (or /e/ before /wC/, or /e/ before a rounded consonant whose rounding is manifested on the consonant onset) is a long mid back rounded vowel when stressed and a short high back rounded vowel when unstressed.

Younger speakers (of perhaps all Arandic communalects) are losing or have lost the velar glide from their language, although it may still be present inasmuch as it conditions primary stress and perhaps additional length on the initial vowel of the word. Thus, a word like *ahentye* 'throat' is pronounced [á˙nʲdʲə], not [anʲdʲá] (although in CAr especially this contrast is obscured by the transfer of the stress in such (surface) VCV words to the initial vowel by all but the oldest speakers). Younger speakers also, as noted above, are replacing word-initial prerounding or a /u/ vowel with rounding associated with the release of the consonant concerned.

3.2 Eastern Arrernte

The dialect referred to here as Eastern Arrernte is that spoken in the Harts Range—Hale River area.

The phonology of EAr is very similar to that of CAr. However, there seems to be phonemic prepalatalisation of apical consonants, of very limited distribution. The allophonic relationship between retroflexion and prepalatalisation that applies in CAr seems to apply similarly in EAr, but a prepalatalised apico-alveolar consonant that does not appear to fit into this system appears in a number of words containing the suffix *-ayte*, which is used to derive the name of an edible grub from its source (usually the tree in which it is found). This suffix may be a loan from Aly or EAnm; the CAr form is *-atye*. It is possible that phonemic prepalatalisation is not found in any other morphemes in EAr. (Prepalatalisation will be discussed at greater length in §4.5)

3.3 Syllable structure

At the surface, Arandic languages certainly have CV syllables: an utterance can consist of just a CV syllable, such as [ma] 'here, take it!'. However, there are some features of Arandic languages that suggest that the traditional syllable is not as central to the structure of these languages as it is of most others. These include:

(i) the variability in the number of (phonetic) syllables in words. For example, the present tense of the verb 'to sit, stay' in Central Arrernte can be pronounced [anə́mə] (with three syllables), [nə́mə] (with two), [anə́m] (with two), or [nəm] (with one).

(ii) the bond between vowels (other than /e/) and the following consonant (which is usually not part of the same syllable, if the rule that a consonant may not form a coda if a following syllable would thereby lack an onset is adhered to) as contrasted with the comparative lack of bond between such vowels and the preceding consonant (which is part of the same syllable, given the onset rule). This is manifested in some pronunciation rules (for example, that the pronunciation of stressed /i/ is dependent on the following consonant, approximately [ɛ] before an alveolar apical, [i] before a retroflex or an alveo-palatal, and in between for others) and also some grammatical rules (to be discussed below). The first linguist to observe this feature of Arrernte pronunciation seems to have been T.G.H. Strehlow (1971:86), who observed that "as a rule it seems to be the consonant cluster that *follows* a vowel which determines its quality in native verse". As an example he quotes the pair of words (in his orthography) alkŋőltjurbalkŋőltja ambı́rkŋambı́rkŋa and says that: "The correct syllabic divisions would be alkŋ-őltj-urb-alkŋ-őltj-a amb-ı́rkŋ-amb-ı́rkŋ-a respectively".[19]

(iii) speakers trying to help an enquirer with the pronunciation of a word do not separate it into syllables but prefer to divide it into word-like parts in which an /a/, /i/, or /u/ (if there is any) occurs initially. Examples are *utnathete* 'mulga blossom', pronounced as *utne*, *athete*, and *anepaneme* 'is still sitting' as *anepe*, *aneme*. (*Anepe* is not a free form and *utne* also seems not to be; *athete* may be, but this is not confirmed.) Another strategy which has been observed is to divide it into syllables, but in which /a/, /i/ or /u/ does not occur finally; for example, *arlalperre* 'yellow ochre' syllabified as *arl-al-perr*.

McCarthy and Prince (1995:318) state the Prosodic Morphology Hypothesis: "Templates are defined in terms of the authentic units of prosody: mora (μ), syllable (σ), foot (F), prosodic word (PrWd) ". The segment is not one of these units of prosody. If we accept the Prosodic Morphology Hypothesis, we need to find some explanation for certain types of reduplication in Arrernte; one (the habitual nominalisation) was briefly illustrated above ((1), §2). Also requiring explanation is the transposition involved in the EAr play language called Rabbit Talk (see Turner and Breen 1984).

Considering briefly only the latter, the output of the transposition on the following four simple words: /ker/ 'meat', /war/ 'only', /arraty/ 'right', and /awenk/ 'young woman' are, respectively: /rek/, /arew/, /atyarr/ and /nkaw/. Disregarding the Prosodic Morphology Hypothesis, the transposition rule would seem to be: transpose the first consonant or consonant cluster plus any preceding vowel to the end; if there was no preceding vowel add the featureless vowel /e/; if /e/ is left in word-initial position, delete it. The transposition can be made to conform to the Prosodic Morphology Hypothesis by postulating that: (1) All

[19] Having read Strehlow's book many years ago, I did not remember this passage until informed by the mention of it in Henderson (1998). It would be interesting to know if he would still have applied this syllable division if the vowel schwa was involved. The first word includes *alkngultye* 'tears' reduplicated with a linking morpheme which I do not know; the second is also reduplicated, but I cannot find it even in Strehlow's own manuscript dictionary.

syllables are of the form VC(C); (2) Utterance-initially, the vowel /e/ does not appear at the surface. The rule then becomes: transpose the first syllable to the end of the word.[20]

Similar arguments apply to various reduplication rules. Breen and Pensalfini (1999) give the arguments in detail, dealing with possible alternative analyses. See pages 5–8 for data, and see Evans (1995:744–7) for a summary (based on Breen 1990).

The most widespread stress rule in Arandic, usually stated: main stress falls on the first vowel that follows a consonant, does not have a simple statement in terms of conventional syllables, but is: stress falls on the second syllable with VC(C) syllables. Henderson (1990) found also that plural and reciprocal morphology is sensitive to whether stems are monosyllabic or disyllabic, but the rule is straightforward only with the VC(C) model.

4. Phonological notes on other Arandic languages

4.1 Antekerrepenh

This dialect, virtually extinct now, was originally analysed (Breen 1977) as a two-vowel language. The reinterpretation of rounding and prepalatalisation as associated with consonant positions in a word rather than with individual consonants has forced a revision of this analysis.

The original analysis postulated two vowels, /a/ and /aˑ/ (now written as *e* and *a*), distinguished basically by length. Initial [ʊ] was phonemicised as /ew/ and initial [ɪ] as /ey/; this led to the postulation of consonant clusters of the form /wC/ and /yC/. These clusters could also occur medially, giving rise to mid back rounded and mid to high front unrounded vowels, respectively. Non-initial [ʊ] was regarded as coming from the influence of a preceding rounded consonant, except that when the consonant involved was not peripheral (an uncommon situation) a /Cw/ cluster rather than a rounded consonant was postulated. Later work on other languages (especially CAr and WAr at that stage) showed that rounded nonperipheral consonants were quite common and this distinction was not warranted. Distinct from /yC/ clusters were prepalatalised apical phonemes /ʸC/, and /e/ preceding these was raised and fronted more than before /y/.

This distinction between /yC/ clusters and /ʸC/ phonemes was later seen as the weak point in the analysis. As long as /wC/ consonant clusters were accepted it seemed reasonable to also accept /yC/. However, when /wC/ was reanalysed as /Cʷ/, with the rounding associated with the consonant, it seemed no longer justifiable to postulate a /yC/ cluster and especially a distinction between /yC/ and /ʸC/.

Ant phonology[21] is now regarded as similar to that of CAr, except that prepalatalised apicals are distinct from retroflexes, as witness the pair *ayntem* 'lying'/*arntem* 'aching' (and contrast also *antyer* 'tongue' and *anter* 'fat' for the corresponding lamino- and apico-alveolar clusters). However, there is fluctuation in some words between prepalatalised apicals and lamino-alveolars, for example, *alya* ~ *ayla* 'we (dual, same section)', *antywem* ~ *ayntwem* 'drinking', *urrartely* ~ *urrarteyl* 'hooked boomerang', and this needs to be studied further.

[20] Evidence from longer words shows that it is the first syllable, not the last, which is transposed. Thus /itetyek/ 'to burn' becomes /tyekit/, not */kitety/.

[21] Which, however, is based mainly on transcriptions done in the 1970s and needs revision in the light of my much greater experience with other Arandic languages.

4.2 Ayerrereng

Ayerrereng, the north-easternmost member of the group, is the least studied of all the Arandic dialects. Araynepenh seems to be an alternative name; they may have the same meaning, as although *ayerrereng* means 'out of the east' in Ay, it means 'out of the north' in dialects to the west, which is essentially the same meaning as *araynepenh* has in Ay and Ant. The only sources of information are a wordlist published by Roth (1897), fieldnotes and grammatical notes with an hour of densely packed tape made by Ken Hale in 1960,[22] and three half-hour recordings, one made by Barry Blake in 1966 and two by me in 1967. It is more closely related to Ant than to Aly; in fact, all three of the speakers recorded in the 1960s called their language Ant at least sometimes.

The two phonological differences noted between Ay and Ant (and they apply also between Ay and Aly) are loss of the velar glide as an audible consonant, although some modern evidence suggests that it is still present in that it contributes to the pronunciation of the word, and loss of prestopping from earlier prestopped nasals. The former is suggested by Roth's *ŭr-nă* 'kangaroo' Typical pronunciations of this word and of the word for 'ground, sand' by a modern speaker are [aɔ́ra] and [aún̥a], respectively (although another speaker pronounced them with the glide as in Ant and Aly), and I write them as *aherr* and *ahern* as in those languages.

Loss of prestopping is illustrated by a couple of Roth items: *ŭn-nă* 'excrement' and *ŭn-gĕ-ră* 'many', implying spellings *ana* and *angerr*,[23] contrasting with Ant *atna* and *akngerr*. The modern speakers had lost the prestopping from some words but retained it in others (and differed from one another in some cases).

Roth's spellings suggest that Ay also shared the Ant peculiarity of pronouncing a homorganic glide before initial /i/ or /u/; examples include *yĕr-tă-pă* for *itep* 'hand' and *woo-ji-lă*[24] for *utyerl* 'sun'. There are a few examples of this in the modern material, and one speaker sometimes transferred the stress to this vowel when he did it (as, it seems, Roth's informant may have too; there may have been a sound change in progress).

4.3 Northern Alyawarr

Alyawarr can be divided (following Hale n.d.) into northern and southern dialects.[25] Traditional Aly country is centred on the Sandover River in the east of the Northern Territory; however, many Aly have moved to the north-east or north-west during the 20th century. Aly is analysed as a three-vowel language, with /a/, /i/, and /e/. Pronunciation of these vowels is essentially similar to that in CAr, but word-medial /i/ is much less common.

22 And I am especially grateful to Ken for hunting down these notes and tape and giving me a copy. He had called the language "Antikiripinhi (Georgina River variety)", and I realised that this material was Ayerrereng (and added vastly to the Ayerrereng corpus) only in the last stages of writing this paper.

23 In fact, of course, it can be taken to imply this spelling only because there are other words in which Roth has written intervocalic velar nasal as *n-g*.

24 Roth used italics to indicate the primary-stressed syllable.

25 I called them Western and Eastern (respectively) Alyawarr when I wrote adult vernacular literacy courses for them, on the basis of the present-day situation in which the largest congregation of speakers of the southern dialect is at Lake Nash, near the Queensland–Northern Territory border and well outside traditional Alyawarr country.

associated, or at release, or both. Rounded onset occurs only with initial consonants and is realised as a vowel [ʊ] or non-vocalic roundness [w]. Labials and velars (unless part of a heterorganic cluster) always manifest their roundness on the release side;[26] other single consonants are much more likely to have rounded onset if the following vowel is /a/, and rounded release if it is /e/. There is a change in progress from roundness manifested at the onset of a consonant (and in many cases also at the release) in the speech of older people to roundness at the release only of the consonant with younger people, e.g. [ʊnʲdʲíɖʲə] and [nʲdʲúɖʲə] (*ntywety* 'warm'), [ʊlʊ́mbə] and [lʊ́mbə] (*lwemp* 'ghost gum'). This is happening even though, in some cases, it results in what, to me, are tongue-twisters: for example [ʲʷɪnʲdʲ] instead of [ʊlʲínʲdʲə] for *lywenty* 'shade', [ʲʷan̥] instead of [ʊján̥] for *ywarn* 'in vain'. These different pronunciations can, however, as the examples illustrate, both be represented by the same phonemicisation and spelling. Another situation, in which the variants are phonemicised and spelt differently, arises when the younger speakers' word has initial /i/. Examples: *nweng* ~ *inweng* 'chest', *lweyel* ~ *ilweyel* 'dying', *rrpwerl* ~ *irrpwerl* 'black'. Practically all have an apical as first consonant.

In other cases the roundness is perhaps never heard on the release, but the word may be pronounced with an initial nonsyllabic roundness, as in [wɪáɾə] *rwarr* 'wind', [wlæʲlp] *lwaylp* 'kurdaitcha (traditional executioner)'. Short stems are often pronounced with an initial rounded vocalic sound when in isolation but with initial rounded consonant when affixed, e.g. [ʊɾá] *rwa* 'fire', [rʊl] *rwel* 'fire-LOC', [ɹʊᵗnpə] *rwetnp* 'hot'.[27]

The high front vowel in Aly has posed some problems in the analysis. Like Kay (§4.5), Aly has prepalatalisation associated with alveolar consonants and, in a comparatively few words, with bilabial consonants. But it also has a substantial number of other words with a high front vowel. It seems perfectly reasonable to argue that [i] before an alveolar consonant is a realisation of /e/ with a following prepalatalised consonant, as in Kay; both the pronunciation and the parallelism with /a/ followed by prepalatalisation support this. Since there are a handful of words in which we must write *y* before a bilabial (such as *aypmenhey* 'mother's mother'—compare Kay *aytnmenhe*[28]—and *aympa* 'pouch'—compare EAr *arnpe*) we could argue that [i] before a bilabial is /ey/. [i] occurs also before velars and it is no great step to writing *y* before them too (suspending a decision on whether we have prepalatalisation or a cluster). However, it is believed that most instances of [i] before a velar may result from reduction of earlier /eye/. Word-initial [ɪ] could be phonemicised as /e/.

26 Although I have on tape an excellent speaker pronouncing the section name *Kngwarrey* as [ʊkŋárɪ]. Note also Yallop's (1977) spelling *upula* of one of the Alyawarr section names.

27 Note that Carol Morris, of the Summer Institute of Linguistics, who worked on Alyawarr at Ali-Curung, informed a meeting on Arandic orthography in Alice Springs in 1981 that speakers she was working with wanted to use *w* instead of *u*. These speakers had no knowledge of Arrernte orthography and had seen Alyawarr words written only in a system in which roundness was thought of as belonging to the vowels and written with *u* and *o*. They consistently chose to write [Cu] as *Cwe*. In the case of initial [ʊ] they again wanted to use *w*; when it was suggested that they needed a vowel and could write *ow*, *uw* or *ew* they chose *ew*. Thus the word for fire was *ewr* (or perhaps *ewre*; they were not normally writing final vowels but perhaps they did on a word like this in which the final vowel is stressed).

28 Also *arlpmenhe* in Antekerrepenh, and *ipmenhe* in Eastern and other Arrernte varieties.

However, when an [ɪ]-initial word is reduplicated the initial vowel is repeated as [iː]. For example, [ɪpə́t̪ə] 'hole' becomes [ɪ̀pə̀t̪íːpə̀t̪ə] 'rough (as a potholed road)', which we would have to phonemicise as /eperteypert/ (with a discrepancy between the representation of the two parts) or introduce a juncture phoneme (to be represented by a hyphen). The latter could be useful in that it could be used as an indication of the changed stress pattern, but there would be problems in deciding when it should be used. We could not evade the issue by writing *eyC* initially, because there is a contrast between initial [ɪ] as in [ɪlkʷá] 'big' and initial [iː] as in [iːlkʷá] 'armpit'.

The phonological problem remains; the orthographical problem has been decided. Prepalatalisation of apicals is represented by *y*; thus *yt*, *yn*, *ytn*, *yl*. A high vowel preceding it is written *e* except when it is word-initial, when it is written *i*. In other cases *i* is written (the following consonant is usually not apical, although it can be, as in the compound locative suffix *-itwel.*). Thus 'big' is *ilkwa*, 'armpit' *iylkwa*, 'hole' *ipert*,[29] 'rough' *ipert-ipert*. Other words with medial *e* include *alatyeyt* 'spinifex', *areyneng* 'euro', and *arreyl* 'cheek', while words with *i* include *thip* 'bird', *apmikw* 'pine tree', *thimp* 'ironwood tree', and words with the derivative *-inger* 'times' (such as *atherr-inger* 'twice').

Hale found that NAly had the velar glide (our /h/) appearing in suffixes (compare the same phenomenon noted below for WAnm). This has also been noted more recently by Green (1992:238; see *-wenh*) for the genitive suffix: *-henh* as compared with *-kenh* for most Arandic communalects. In NAly as I have recorded it this has become a labio-velar glide /w/. Thus we have *akerew* 'for meat', *arew* 'saw', *areyew* 'to see', and *arelh-wenh* 'woman's' corresponding to CAr forms *kereke*, *areke*, *aretyeke* and *arelhekenhe* respectively.

Note the softening of the *[t̪ʲ] of the verbal purposive to [j] in words like *areyew*. The same softening is observed in the present continuous suffix *-eyel*, as in *areyel* 'seeing'; the equivalent form with the stop, *aretyel*, is used in one or more communalects of EAnm.

A feature that Aly shares only with Kay is clustering of prestopped nasal with stop, both homorganic and heterorganic. Examples are *apmpeyel* 'burning', *awethnth* 'dogwood', and *artnkwa* 'clothes'. Some speakers reduce these prestopped nasals to simple nasals; indeed, some speakers reduce many other prestopped nasals in the same way, as in the section term Ngwarrey instead of Kngwarrey.

A sound change between the northern and southern languages is an assimilation that transforms a lateral–nasal or lateral–prestopped nasal cluster (it is pronounced and generally regarded as phonemically prestopped, but does not contrast with simple nasal in this environment) into a nasal–nasal cluster. For example, *alknge* 'eye' in several southern languages (including SAly, where it is spelt *alknga*) corresponds to *annga* in NAly.[30]

4.4 Southern Alyawarr

Southern Alyawarr, studied mainly at Lake Nash, probably has the same phonological analysis as the Northern form, but phonetically the switch from initial rounded vocalic sound to initial rounded consonant has not advanced so far. This dialect also has the common Arandic suffixes *-k* (dative), *-k* (past tense), *-tyek* (purposive), and *-kenh* (genitive), rather

29 Final *a* is written only in words in which it would—at least in citation form—carry primary stress. This vowel would be written *e* in some dialects.

30 See Green and Turpin (this volume).

than the softened Northern forms described above.[31] It is thus phonetically (and also lexically) somewhat closer to CAr than is NAly (which is consistent with its southern provenance, as opposed to its present day geographical remoteness).

4.5 Kaytetye

Kaytetye is classed as a separate language, not mutually intelligible with the other Arandic communalects (which are thought by some to be dialects of a single language). I have not had much contact with it, and the following notes are based mainly on Koch's published and unpublished material, with some reference to Hale's unpublished wordlists and my own meagre field notes.[32]

Koch (1984:33 note 4), following Hale (1959), analyses Kay as a two-vowel language. The Kay consonant inventory and Koch's analyses of it differ from that of CAr in having a set of prepalatalised apical consonants. I have made some use of, and taught, an orthography based on this analysis and have had no problems with it.

Koch's low vowel /a/ is pronounced generally like the corresponding vowel in CAr. The mid vowel /e/ is [ɪ] initially except when the following consonant is rounded or prepalatalised; see below for the pronunciation in these situations. Medially it is usually pronounced in a similar way to /e/ in CAr. A high front vowel (lengthened when stressed), if not occurring before /y/, is interpreted as /e/ followed by prepalatalisation of the following consonant. This interpretation is supported by the fact that /a/ also occurs in the same environment, the combination of /a/ and prepalatalisation being realised as a diphthong [æj] (as in the language name). Koch's prepalatalised alveolar consonant series and /y/ account for the vast majority of the occurrences of [i] or [iː] and of [æj]. Examples include *keyte* 'firestick', *kayte* 'edible grub', *alatyeyte* 'spinifex', *areynenge* 'euro', *aynenhe* 'eat-past', *eynenhe* 'get-past', *kayle* 'boomerang', and *aylperre* 'fish'.

However, there are also a small number of vowels of this quality preceding bilabials, and these pose a problem. The alternatives seem to be to postulate a series of prepalatalised bilabial phonemes, which does not appeal as a natural solution, or to have clusters /yp/, /ym/, /ypm/, and /ymp/, which do not conform to the phonotactic rules (for Arandic languages in general). The words involved can mostly be explained away on a diachronic level: for example, Koch's *atnaympe* 'buttocks' was earlier recorded by Hale as *atnaynpe*, while *paympelhe* 'feather' (Hale and Koch) is cognate with Aly *aynpelh*, and *arreympeympe* 'lips' is probably cognate with CAr *arreyenpe* from *arre* 'mouth' and *yenpe* 'skin'.[33] If we postulate */ʸnp/ as the ultimate origin for all /ymp/ we have disposed of perhaps 80 per cent of the prepalatalised bilabials. Others, like *eypeype* 'sheep' (compare *yepeyepe* in other dialects) and two of the three instances in Koch's vocabulary of palatalisation before a velar, *naneykwerte* 'goat' (from English *nannygoat*) and *parreyke* 'fence' (from English *paddock*), are recent loans. However, these words exist now and must be fitted into the phonemic system, along with others, such as *nteyngke* 'ripe' and *anytyeypere* 'bat', which

31 A purposive allomorph *-eyek* is sometimes heard; this shows the same softening of *[t̪ʲ] as does Western Alyawarr *-eyew*.

32 A learners' grammar by Myfany Turpin, based largely on Koch's material, has appeared (Turpin 2000).

33 And note also Arrernte *arrirnpirnpe* [aríjnbìjnbə]; both this and the Kaytetye term probably result from fusion of syllables of an earlier **arreyenpeyenpe* (although, as Koch pointed out to me, we should note also *winpinpi* 'lips' in Pitjantjatjara and *pinpinpa* 'flat and thin' in Warlpiri).

there seems to be no neat way of disposing of. Koch (pers. comm.) prefers to regard these as clusters rather than to extend the prepalatalisation analysis to non-apicals.

The fact that /ʸnp/ becomes /ymp/ (/ʸmp/?)and not /mp/[34] suggests that prepalatalisation is, like rounding, associated with the consonant position in the word rather than being a feature of a consonant phoneme. The supposed /ʸn/ is not to be regarded as a single unit but as /n/ influenced by suprasegmental palatalisation—a palatal coarticulation associating itself with any compatible consonant at that position, and so only the /n/ is assimilated to the following stop, with the palatalisation left to attach itself to the bilabial cluster. This avoids the difficulty of the alternative propositions: (a) that prepalatalised apical is a seventh point of articulation, and (b) that the prepalatalised apicals are complex phonemes. The difficulty with (a) is that the articulatory difference between prepalatalised and other apicals does not seem to be one of place in any consistent way. Auditorily, at least in Arrernte,[35] they seem to range between the two other apicals in point of constriction (or, more loosely, place of articulation), and instrumental analysis (Butcher forthcoming; Henderson 1998:86, 151–66, and esp. 153 and 156) shows that the region of contact is 'roughly intermediate' between those for the other two, and so more or less similar to that of apicals in environments where the opposition is neutralised.[36] The difficulty with (b) is that these phonemes are not complex in that they are not of one type (palatal) from the viewpoint of segments preceding it, and of another type (apical) from the viewpoint of segments following. This can be seen from the behaviour of certain allomorphs of verb tense suffixes, as noted by Koch (1980). The present and past tense suffixes are underlyingly *-nke* and *-nhe* (or, as I would prefer it, *-enk* and *-enh*). After an apical consonant, however, the nasal of the present tense suffix becomes retroflexed, while after a palatal (lamino-alveolar) consonant the past tense suffix is palatalised, becoming *-nye*. Thus *ak-* 'to cry' (my segmentation) has present *akenke* and past *akenhe*, *ar-* 'to see' has *arernke* and *arenhe*, *arrty-* 'to try' has *arrtyenke* and *arrtyenye*, and *ayl-* 'to sing' has *aylernke*[37] and *aylenye*. It can be seen that, from the viewpoint of the following consonant, roots whose final vowel is a prepalatalised apical behave both as apicals (in having /rn/ in the present tense) and as lamino-alveolars (in having /ny/ in the past tense).

It may be that palatalisation can migrate in a similar way to rounding, with the difference that when it becomes associated with the release of an alveolar consonant the resulting combination merges with the already existing lamino-alveolar phoneme and the palatalisation loses its moveability. An example of the process envisaged is given by the history of the word for 'boomerang' in some dialects. The word *karli* [kə́li], still existing in some non-Arandic languages, lost its final vowel, lost its initial consonant (or perhaps lost its initial syllable and had it replaced by /a/), became prepalatalised giving [aʲl], lost its retroflexion—[aʲl], and underwent migration of palatalisation to give the modern CAr and EAr word *alye* and WAnm *aly(ang)*.[38] The second last stage is preserved in *aylayl* (Aly and

34 A change /np/ to /mp/ has not been observed except in young people's speech in some areas.

35 In which, however, prepalatalisation is not contrastive.

36 There are differences, however, and Henderson (1998) deals with these and the complexities underlying the use of such terms as 'point of constriction' in these contexts.

37 In fact, this word and *arernke* are misspelt to make the demonstration clear; the predictable retroflexion in these words is not written in the orthography.

38 Koch (1997:280–1) shows that this was conditioned by a vowel /i/ following an apical consonant.

Ant) and *kayle*[39] (Kay). The first two stages—loss of initial consonant or syllable and loss of final vowel (not necessarily in that order) are attested in hundreds of Arandic examples. Prepalatalisation and deretroflexion of retroflexes occurs as a subphonemic process in several Arandic dialects (see §3.1). As Koch (pers. comm.) points out, these are the dialects that had already merged the prepalatalised apicals with the palatals.

There is a change going on in Kay from an older style in which rounding spreads right over a consonant or cluster to a newer style in which it is confined to the release. For example, the word spelt *erlkwe* is pronounced [ʊl̥kʷá] by older speakers and [ɪl̥kʷá] by younger. Another difference between younger and older speakers is that the former are losing the velar glide; however, a trace remains in the form of length and stress on the initial vowel. For example, the spelling *aherre* represents [aɯ́rə] for older speakers and [á:rə] for younger speakers. A spelling *arre* would represent [arə́]. (This is the case also for Aly, in which, however, the spelling is *aherr*, and for Arrernte.)

A reservation regarding the two-vowel analysis concerns the pronunciation of morpheme-initial /e/ when it is utterance-medial. One test for the two-vowel system is, of course, reduplicated words that begin with /e/ (not followed by *yC* or *Cw*)—does the initial vowel reduplicate as schwa or [ɪ]? There are a few such items, and in these the third vowel is in fact [ɪ]. Similarly, it seems that word-initial /e/ (not followed by *yC* or *Cw*, and not preceded by a pause) is realised as a high-front vowel.

The two-vowel analysis can be saved by a rule that a word boundary conditions fronting of a following /e/ and by assuming an internal word boundary between the two parts of a reduplicated form. This is the approach adopted by Koch.

If Kay does in fact have only two vowels this poses a problem for the application of the VC(C) syllable model to it, despite the fact that its morphology seems compatible with that model (while, however, lacking the prefixing reduplicative process and the word game which make the model particularly compelling for Arrernte). A language that has a contrast between two word-initial vowels and also has (surface) word-initial consonants needs to have three vowel phonemes so that one is available to be present underlyingly in initial position in the consonant-initial words. I would prefer to postulate three vowels to save the VC(C) syllable model rather than accept Koch's approach to save the two-vowel analysis.

A difference in phonological analysis between Kay and Aly, which may or may not represent a real difference between the two, is that in the former a pair pronounced by some speakers with initial rounded vowel and by others with initial unrounded vowel has the same phonemicisation and spelling; in the latter it is a pair pronounced by some speakers with initial rounded vowel and by others with no initial vowel that has the same phonemicisation and spelling. Thus, taking for example the word for 'up' in the two languages, there are four possible pronunciations (with associated spellings which indicate the way they are phonemicised):

pronunciation	ɪrʊ́l̥ə	ʊrʊ́l̥ə	ʊrə́l̥ə	rʊ́l̥ə
Kaytetye spelling	*errwele*	*errwele*	*errwele*	*rrwele*
Alyawarr spelling	*irrwerl*	*rrwerl*	*rrwerl*	*rrwerl*

The differences between Kay initial *e* and Aly initial *i*, between the Kay spelling of a predictably retroflexed lateral as *l* and the Aly as *rl*, and between the presence of final vowel

39 It is doubtful that the /k/ here is original; there are a few other examples of /k/ replacing a lost initial vowel in Kaytetye.

in Kay and its absence in Aly are simply different orthographic conventions. An obvious conclusion is that this could be due more to the different approaches of the two linguists concerned than to a real difference in the facts, and this will have to be investigated. The facts certainly are not the same in the two cases, however.

4.6 Eastern Anmatyerr

Although the name Anmatyerr has been used generally as the name for an Arandic communalect, there is a clear division into an eastern form and a western form which are, at least superficially, very different. EAnm seems to be more closely related to EAr and SAly than to WAnm, although this perception is influenced by the phonetic and phonotactic differences and by the prevalence of Warlpiri loans in the western form. Its phoneme inventory is the same as that of EAr except that it has the prepalatal/retroflex distinction.

4.7 Western Anmatyerr

Phonetically, Western Anmatyerr is noticeably different from the other Arandic languages. It may be a genuine two-vowel language in the extreme west of its range. A wordlist of perhaps 1500 words (Breen 1988), compiled mainly from information from speakers in the Mount Allan area, uses a two-vowel orthography without problems, as does a transfer literacy course developed for this area (Breen n.d.). Pronunciation of the two vowels is, briefly, as follows:

/a/ is generally similar in pronunciation to its CAr counterpart except when it follows a rounded consonant or consonant cluster, when it is rounded and retracted. The rounding of the vowel may be the only indication of the roundness associated with the consonant(s); this is a normal situation in all Arandic languages with the vowel /e/ but does not occur in other languages when the vowel is /a/. Examples are [mɒŋ] *mwang* 'snake' (cognate with *apmwe* and *apme* in some other dialects), [t̪ɒj] *rtway* 'burrowing bettong' (cognate with *purtaya* in Warlpiri), [t̪ɒˑk] *rtwak* 'windbreak', and [ndʷɒɾ] *ntwarr* 'on the other side'.

/e/ in many environments tends to be much more raised and fronted than in other languages although, especially with older speakers, it is also often realised as the typical Arandic central vowel. Details of the conditioning factors for this alternation are not well known. Examples include [aním] ~ [anə́m] *anem* 'sits', [apík] ~ [apə́k] *apek* 'maybe', [míŋ] *meng* 'fly', [ŋín̪əm] *ngernem* 'digging', [wə́ɹɪŋgɪɾ] *werengkerr* 'spindle', and [l̪kérəmbɪl̪kɛ̀r] *rlkerremperlkerr* '(sitting with) legs straight out'. After a rounded consonant /e/ is rounded, as in other dialects, and the rounding might spread some distance from its source; examples are [kúnʲʊl] *kwenyel* 'in the dark', [ɾúmbʊɹ] ~ [ʊɾúmbʊɹ] *rrwemper* 'shovel spear', and [nʲdʲúŋʊnʲdʲ] *ntyengwenty* 'white clay'. Unlike in other dialects, a rounded vowel is common before /y/; for example, *ntywey* 'Hakea spp.' may be realised as [nʲt̪ʲújᵘ], as compared with [nʲdʲwiː] (spelt *ntyweye*) in WAr. In initial position /e/ is usually [ɪ], as is /i/ in other dialects: [mím] *enem* 'gets', [ɪwínʸ] *eweny* 'mosquito'.

As in NAly, rounding may be manifested at onset of the consonant or consonant cluster with which it is associated, or at release, or both. Rounded onset occurs only with initial consonants and is realised as a vowel [ʊ] or nonvocalic roundness [w]. Peripherals (unless part of a heterorganic cluster) always manifest their roundness on the release side; other single consonants are much more likely to have rounded onset if the following vowel is /a/, rounded release if it is /e/. Again as in NAly, rounded release is more likely with younger speakers. Examples include *kwenyel*, *rrwemper* and *ntyengwenty* in the previous paragraph, and also [ʊn̪ʊ́ŋ] *rnwang* 'water dish' (cognate with Arrernte *urtne*), [ʷlʸɑŋ] *lywang* 'shade', and [lʲʊl] *lywel* 'in the shade'.

Moving east from the Mount Allan area where these words were recorded, we come first to Napperby, where Jenny Green (pers. comm.) has found a couple of possible contrasts, such as that between *mernt* 'then' and *mirnt* 'sick'. Further east again, I have found at Ti Tree four words:[40] (*aningk* 'many', *ngkiken* 'kurdaitcha', *parrik* 'fence' (a loan from English *paddock*) and *arriw* 'door') and one bound morpheme (*-ikw* 'third person possessor of kin') which have a high vowel contrasting with *e*. All of these have correspondents further west which can be written with *e*. The far western equivalent of Ti Tree *mikw* 'his or her mother' (*m* 'mother' plus *-ikw*) is *mwek* (*m* plus *-ekw* with movement of the rounding to the preceding consonant).

Some other features of WAnm which set it apart from other languages include the following:

(a) prestopped nasals are absent. Hale (n.d.) and before him Strehlow (1944:18–22) found that Anmatyerr had long nasals corresponding to the prestopped nasals of other communalects, but my informants (even the oldest) had only ordinary nasals. Occasional lengthening or (for one of my informants) prestopping seems to have no phonological significance. (Hale's wordlist was collected at Napperby, in the WAnm area.)

(b) initial /y/ before /e/ is not pronounced and so initial /ye/ can be distinguished from initial /e/ only by the phonetic features resulting from the fact that it is stressed and, if it is a surface monosyllable, by the fact that it is never augmented by *-ang*—see (e). Examples are [ɪɾakʊɾə] *yerrakwerr* 'wild onion' and [iːtʸ] *yety* 'no'.

(c) /h/ occurs as an optional (and more common) alternative to /k/ in certain suffixes which have /k/ in most other communalects, notably dative on a noun and purposive on a verb. WAnm is thus the only Arandic communalect at present (with the marginal exception of the NAly suffix *-henh*, mentioned above) in which /h/ can occur other than as the first consonant in a word or the second part of a compound or reduplication. When the word contains any roundness, the /h/ is rounded to /w/ (although the suffix is still written *h*), e.g. [atúʲuw] *atwetyeh* 'to hit'. With palatalisation the /h/ and its preceding /e/ are together pronounced [ɛː], as in [atáˑn̪t̪əʲɛː] *atanthetyeh* 'to spear'. In other cases the suffix is pronounced [aː], as in [kə́ɹaː] *kereh* 'for meat'.[41]

(d) when it precedes the primary stressed vowel, /h/ is often realised (always by younger speakers) not as a glide but as a changed quality in the vowel or as zero (and with the vowels flanking it occurring contiguously or merging). Examples are: [aérə] *aherr* 'kangaroo' ([aɯ́ɾə] from an old speaker), [ɛjnʲdʲ] *ahenty* 'throat', and [aːki] *ahakey* 'fruit sp.'.

(e) stems with no phonemic vowel or only an initial vowel, if not otherwise suffixed, usually take an augment *-ang*. Some examples have appeared in earlier paragraphs; others include *alhang* 'nose', *aywang* 'old man', and *yang* 'he, she'. The same is often added to

40 In the course of teaching vernacular literacy—not in an extensive search.

41 It was perplexing to hear the sentence [jáŋkə́ɹaɭə́m] 'He's going for meat' because I segmented it as *yang ker alhem* (with no dative marking on *ker* 'meat') instead of the correct *yang kereh lhem*.

imperative verbs; e.g. *tywempelhang* 'wait', *anerrerrang* 'stay (plural addressee)'. Young speakers are reanalysing the short words to include the *ang* as part of the stem (and also dropping initial vowels); thus, for example, 'man.ERG' is *rtwangel* instead of *artwel*.

(f) word-final vowels are much less common than in most other communalects, but when they do occur they are likely to be subject to the spread of rounding from the word or (less commonly) palatalised by an adjacent /y/. In other languages this happens in connected speech but not in citation forms. Examples: [ɸʊ̟ɻpʊ] *tywerlp* 'tree sp.', [ɸʊ̟jʊ] *lywey* 'tree sp.', and [tʌ́ji] *tay* 'moon'.

(g) in young people's speech /th/ is sometimes pronounced [s]; examples are [sɛp] *thep* 'bird' and [sʊ́ki] *thwakey* 'mouse'.

The status of word-initial vowels, especially /e/, in WAnm needs further study. These vowels are often dropped; note particularly words like *wepawem* 'still hearing' in which the initial /a/, present in the simple present tense form *awem*, is realised only in the second half of the reduplicated form. Both *ewem* 'throwing' and *wem* 'hitting (with a missile)' reduplicate to *wepewem*. The latter verb (stem *w-*) seems to be disappearing as a free form, perhaps because of the likelihood of confusion with the former (stem *ew*). Hale (n.d.) gives it as an alternative to *ltewem*, but in my corpus it appears only once as a clearly free form (with the meaning 'produce (e.g. a work of art)'). These two stems, *ew* and *w*, are the only known examples of a minimal pair *#eC / #C*. About a third of the hundred odd stems recorded with initial /e/ are also recorded from someone else who pronounced them with no initial vowel. There are many differences in this respect between speakers of Coniston origin and those of Napperby origin (although these places are only about thirty miles apart). Anmatyerr at Ti-Tree is different again (per Avery Andrews, various manuscript materials, also per my own observations while briefly teaching literacy there). It may be that WAnm has only recently become a two-vowel language and that initial /e/ has been disappearing since then.

Insofar as it has only two vowels, WAnm is in the same situation as Kay regarding VC(C) underlying syllables. This may be connected with the gradual disappearance of initial /e/. Or it may be that these supposed two-vowel languages should be analysed as having three vowels: /i/ which occurs only word- or perhaps morpheme-initially, /e/ which surfaces only word-medially but is also present underlyingly initially where there is no other vowel, and /a/. (There have, incidentally, been moves to change orthographies to fit such a situation, but the motivation has been to maximise uniformity between the different orthographies.)

4.8 Tyurretye Arrernte

This language, recorded first from a speaker (MW) at Mbunghara in the Western MacDonnell Ranges (and I called it Mbunghara dialect for several years) and also from a speaker (EM) from the Standley Chasm area (and a very little from a couple of others), was not known to linguistics until the mid-1980s. There are some differences between the speech of these two (who have both now passed away) but they do not seem to be of great significance. The name I use for the language was given to me by one of them; however, it is also used for what I am calling Western Arrernte. I speculate that this language is actually the 'real' Western Arrernte, and that the quite distinct dialect known now as Western Arrernte arose from mixing of this dialect with Southern Arrernte (Pertame) at Hermannsburg Mission in the early days of European contact. It is not clear whether there

are any competent speakers remaining now. It seems to be closer to WAr than to any other dialect, but a couple of phonotactic differences stand out (as well as lexical and probably other differences): (a) there is a greater frequency of initial vowels in this language, and (b) initial /ir/ is permissible. This is not permissible at all in most dialects; WAr has it in one word, the third-person pronoun *ire*, but in the speech of some speakers the initial vowel is actually /e/ (which occurs initially on the surface in no other root in the language). The same pronoun occurs also in Per and has been attested, although perhaps incorrectly, in LAr. Examples include the pronoun *ire*, and also *irelhe* 'person', *irethape* 'baby (at the crawling stage)', *irenge* 'euro', *irawirr* 'to scatter (them)', and *irak* 'to grab (something from someone)'.

A third feature, heard only from MW and that not consistently, is replacement of the velar glide (which has been lost from WAr, except perhaps by a handful of the oldest speakers) with /w/.[42] Thus the word for 'kangaroo' is *awerre ~ aherre*, compared with WAr *herre* (oldest speakers), *arre* or—compounded with the generic *kere* 'meat, animal'—*kerarre* (which is also EM's version). Similarly, he used *awe* 'anger', *awelhe* 'ground', *awelke ~ ahelke* 'daylight', and *awinenhe ~ ahinenhe* 'woma (snake)'. Another word heard only with the velar glide is *ahentye* 'throat, liking' (EM's *antye*). The glide has been lost from *areknggerre* 'fast' (/ar/ + /ekngerr/, cf. CAr and EAr *ahere*).

A significant difference from the eastern and northern languages is the existence of a few stems with final /a/—a situation which is not consistent with a rule that all morphemes end with a consonant. These stems are the interrogative *ntha-* 'where?' and a handful of common verbs: *irtna-* 'to be standing', *tnya-* 'to dig', *ntya- ~ intya-* 'to smell (intr.)', *wa-* 'to hit (with a missile)', and perhaps *lha-* 'to hunt away' (heard only once, from EM).

4.9 Western Arrernte

The most noticeable difference between Central Arrernte and Western Arrernte is the comparative absence of initial vowels, especially /a/, from the latter.

There are numerous examples of a correspondence between initial rounded vowel followed by nonperipheral consonant or cluster in CAr (accepting here the four-vowel analysis) and initial rounded consonant or cluster in WAr. Compare CAr *ultakeme* with WAr *ltwakeme* 'breaking', *utyerrke* with *tywerrke* 'fig', *ulyepere* with *lywepere* 'thigh', *urrepurrepe* with *rrweperrwepe* 'whirlwind', and *utnantheme* with *tnwantheme* 'is selfish'. (Both members of many such pairs are used in WAr. See also Breen (2000:vi-vii). If we accept the more radical of the alternative analyses given in §3.1, the only differences between these CAr and WAr forms would be on the phonetic level.) Variants include dropping the rounding altogether, as in *utyewe* and *tyewe* 'thin', *urewe* and *rewe* 'floodwater' (and note the other source of roundness in these words), and *uyenpere* and *yenpere* 'spearwood', and adding initial /i/ to the WAr forms, as in *uterne* and *itwerne* 'summer', *urrke* and *irrkwe* 'pus'. Some *u*-initial roots become consonant-initial in compounds, e.g. *ure* 'fire' in the name *Rwepentye*. With bilabials, on the other hand, we have a regular loss of roundness from the WAr form, often with change of the vowel from /e/ to /a/: *mpwele* (CAr) and *mpale* (WAr) 'you two'; *mpwere* and *mpare* 'maggot'; *mpwerne* and *mparne* 'brother-in-law'; *mwere* and *mare* 'mother-in-law', *mwerre ~ mwarre* and *marre* 'good',

[42] MW's first language was Luritja, and his pronunciation of these words may be influenced by Luritja phonology.

pwere and *pare* 'tail', *apmwe* and *apme* 'snake'. (There are a handful of exceptions.) At the same time there is a strong tendency to nonphonemic rounding of /e/ between bilabials, and some tendency between a bilabial and another consonant, especially a velar. For example, *mpeme* 'burning' is [mbʊ́mə]. Compare the pairs [ɪɾkʊ́mə] 'holding' and [ɪɾpʊ́mə] 'entering'; the imperatives are, respectively, [ɪɾkʷǽj] and [ɪɾpǽj]—*irrkwaye* and *irrpaye*, showing that the stems must be *irrkw* and *irrp* and that the present-tense forms must be written *irrkweme* and *irrpeme*.

As well as having many words with initial /i/, some WAr speakers have a single root with initial /e/—the third person singular pronoun *ere* (which occurs as a free form and in a handful of inflected and derived forms). That this is a phonological difference and not just a matter of initial /i/ being pronounced as schwa before /r/ is shown by the fact that it is rounded by a preceding rounded consonant, for example, the sequence *artwe ere* 'man he' is [aṭʊ́ɹə]. It is, however, conventionally spelt *ire* (which corresponds to its pronunciation for other speakers).

Illustrating the close bond between a vowel and the following consonant is a tendency for /a/ to replace /e/ before /ɾɾ/, as in *ntekarre* 'south' (*antekerre* in several other dialects), *ntyetyarre* 'frog' (*antyetyerre*), and *tyeparre* 'important' (*atyeperre*). Reduplication seems to follow a VC(C) syllable model although there are few relevant examples because of the preponderance of surface-consonant-initial morphemes; two examples are *rrirnpirnpe* 'lips' and *urrthurrthe* 'owlet-nightjar'. However, the existence of stem-final /a/ makes the application of VC(C) syllables problematical.[43]

4.10 Pertame

Pertame, or Southern Arrernte, generally resembles Western Arrernte. Loss of the initial vowel has been more extensive in Per, however. In particular, it has affected words of the form /a(C)Cʷ/, which have compensated for the loss of their initial /a/ by transferring the roundness from the release of the consonant to the onset, resulting in a rounded initial vowel.[44] Words which have been modified in this way include *urte* 'man' (from *artwe*), *ulhe* 'blood' (*alhwe*), *uke* 'right hand' (cf. *akwe* 'arm' in some dialects), *unke* 'asleep' (*ankwe*) and *urlte* 'empty' (*arltwe*). A similar change has occurred in some longer words, e.g. *urrempe* 'cousin' from *arrwempe* and *kukeme* 'biting' from *kakweme*. In the latter case the reason is obviously not loss of an initial vowel, but presumably the /a/ vowel was first reduced to /e/. In other cases roundness on release in Per corresponds to onset roundness in other dialects; for example *lwarre* 'facing this way' corresponds to CAr *ularre*.

Per is the only Arandic communalect (but see fn. 23) which permits [ʊC] with peripheral C (other than in loan words from English); there are two examples of /uk/ in the previous paragraph, and an example with a bilabial is *anupme* 'spinifex wax'. It appears that this happens in circumstances similar to those in which rounding moves forward to the onset of a consonant in other communalects. Thus, for example, *punge* 'hair', in which the first vowel is

43 Note McCarthy and Prince's (1986:note 50) description of Western Arrernte as "a language in which the requirement that syllables have onsets seems to be nearly suspended".

44 Koch (1997:286) regards this rather as preservation of initial /u/, and so a conservative feature. This implies that the transfer of rounding from vowels to consonants did not occur in this dialect. However, there seems to be ample evidence that it did; for example, /tw/ 'to hit' has present tense [tʊ́mə] but imperative [twæy]. Similar considerations apply to Lower Arrernte (§4.11).

phonemically /e/, contrasts with *ingwe* 'night', in which the forward movement of roundness is prevented by the vowel /i/.

Fluctuation in the location of the realisation of roundness is noted in alternative pronunciations of words with /ɾɾ/ occupying the first consonant position: *rrweketye* and *urreketye* 'woman', *rrwekele* and *urrekele* 'first'.

Per has at least the same /a/-final stems as WAr.

4.11 Lower Arrernte

Lower Arrernte has also been called Lower Southern Arrernte and Alenyerntarrpe (the latter, used by some speakers of dialects to the north, is uncomplimentary); the name preferred by the most authoritative of the handful of partial speakers I worked with is Arrernt Imarnt, literally 'solid Arrernte'. The best material available on it is two hours of tape and associated fieldnotes by Hale.[45]

This language is characterised by extensive movement forward of rounding to consonant onset (written as *u*). Common words written with initial *u* include *unek* 'my' (*nweke* in Per, and cognate with *anwek-* 'we plural (dative)' in some other Arandic languages), *unarr* 'we plural' (and other kinship-related pronouns such as *unakerr*, *unantherr*, and *angunantherr*; the *un-* corresponding to *nw-* or *anw-* elsewhere), and *untya* 'nest' (*antywe* in languages to the north). An unusual one is *unew* 'spouse' (*newe* or *anew(e)* in other languages); here the initial round vowel is perhaps conditioned by the /w/ later in the word (unless the proto-form is not **anew* but **anwew*). In some words roundness is heard both before and after a consonant position and for the time being at least is written in both positions, although this is not necessary. Examples are *urtwa* 'man' (*urte* in Per, *artwe* in most of the other languages), *urlkwem* 'eating' (*lkweme* in Per, *irlkweme* in WAr, *arlkwem(e)* in several languages), and *urrwirl* 'sandfly' (compare *urrirlke* 'march fly' in EAr and related forms in other languages). Examples of onset rounding on peripheral consonants include *kungker* 'elder sister' (compare *angkwer(e)* in some languages; the initial *k* probably results from prefixing of *kw-* which occurs with some kinship terms referring to females), *ungkaperr* 'dance' (Per *ngkwaperr*), *pung* 'a type of cloud', *ukepenh* 'even, square', *upern-upern* 'rotten', and the suffix *-ukw* 'first' (and note rounding also on the release; compare CAr and EAr *-urrke*).

Arrernt Imarnt is the only language which permits the velar glide to follow /i/. In a number of words initial *ih* corresponds to initial *h* in WAr (in the speech of those few old people who still use this consonant) and initial *ah* in other dialects. Examples include *ihelh* and *ihern*, both 'ground, sand', *iherlkem* 'getting light', *ihenterr* 'woman's mother-in-law', and *ihanem* 'going' (corresponding to an avoidance term in some languages; the circumstances of its usage in this language are not known, but it is not the normal term). Others without known cognates elsewhere are *iherirr* 'face' and *ihuler* 'grave'; the latter has the sequence *hu* which is quite rare (although not unexpectedly so, as both /h/ and medial *u* (however we phonemicise it) are quite uncommon; three examples are known from communalects of CAr and/or EAr). A number of other words which have initial *ah* in other languages also have it in this one, for example, *ahenty* 'throat', *aherr* 'kangaroo', *ahert* 'bilby', *ahinenh* 'woma (snake)', *aha* 'anger', and *ahakey* 'type of fruit, bush currant'.

45 The tape summarises the results of a longer period of fieldwork.

References

Breen, Gavan, 1971, A description of the Waḻuwara language. MA thesis, Monash University.

1977, Andegerebenha vowel phonology. *Phonetica* 34/5:371–91.

1988, Arrernte phonology and antisyllables. MS, School of Australian Linguistics and Institute for Aboriginal Development, Alice Springs.

1988, Western Anmatyerr wordlist. Institute for Aboriginal Development, Alice Springs. Revised 1995.

1990, The syllable in Arrernte phonology. MS, School of Australian Linguistics and Institute for Aboriginal Development, Alice Springs.

2000, *Introductory dictionary of Western Arrernte*. Alice Springs: IAD Press.

n.d., Anmatyerr literacy course. MS, School of Australian Linguistics, Alice Springs.

Breen, Gavan and Rob Pensalfini, 1999, Arrernte: a language with no syllable onsets. *Linguistic Inquiry* 30/1:1–25.

Butcher, Andrew, forthcoming, *The sounds of Australian languages*. OUP.

Capell, A., 1956, *A new approach to Australian linguistics*. (Oceania Linguistic Monographs 1) Sydney: Oceania.

Evans, Nick, 1995, Current issues in the phonology of Australian languages. In John A. Goldsmith, ed. *Handbook of phonological theory*, 723–61. Cambridge, Mass.: Blackwell.

Green, Jenny, 1992, *Alyawarr to English dictionary*. Alice Springs: IAD Press.

Hale, Kenneth, 1959, Preface to Kaititj field notes. MS.

1960, Antikiripiṇi (Georgina R. variety.) MS.

n.d., Arandic word list. Archives of languages of the world, Indiana University, Bloomington.

Henderson, John, 1990, Number marking in Arrernte verbs. MS. Institute for Aboriginal Development, Alice Springs.

1998, Topics in Eastern and Central Arrernte Grammar. PhD thesis, University of Western Australia.

Henderson, John and Veronica Dobson, 1994, *Eastern and Central Arrernte to English Dictionary*. Alice Springs: IAD Press.

Koch, Harold, 1980, Kaititj nominal inflection: some comparative notes. In B. Rigsby and P. Sutton, eds *Papers in Australian Linguistics* 13: *contributions to Australian linguistics*, 259–76. *PL*, A-59.

1984, The category of 'associated motion' in Kaytej. *Language in Central Australia* 1, 23–34.

1997, Pama-Nyungan reflexes in the Arandic languages. In Darrell Tryon and Michael Walsh, eds *Boundary rider: essays in honour of Geoffrey O'Grady*, 271–302. *PL*, C-136.

McCarthy, John J. and Alan S. Prince, 1986, Prosodic morphology. MS. Brandeis University, Waltham, Mass., USA.

1995, Prosodic morphology. In John Goldsmith, ed. *A handbook of phonological theory*, 318–66. Oxford: Basil Blackwell.

Roth, W.E., 1897, *Ethnological studies among the north-west-central Queensland Aborigines*. Brisbane: Government Printer.

Strehlow, T.G.H., 1944, *Aranda phonetics and grammar*. (Oceania Monograph 7) Sydney: University of Sydney.

1971, *Songs of Central Australia*. Sydney: Angus and Robertson.

Turner, Margaret Mary and Gavan Breen, 1984, Akarre Rabbit Talk. *Language in Central Australia* 1:10–13.

Turpin, Myfany, 2000, *A learner's guide to Kaytetye*. Alice Springs: IAD Press.

Wilkins, David, 1989, Mparntwe Arrernte (Aranda): studies in the structure and semantics of grammar. PhD thesis, The Australian National University.

Yallop, Colin, 1977, *Alyawarra: an Aboriginal language of Central Australia*. Canberra: AIAS.