6

The Mission Orthography in Carl Strehlow's dictionary

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Introduction

This chapter provides an analysis of the orthography used for Aranda in the Carl Strehlow dictionary, and places this system in its historical context. Readers who are primarily interested in the immediate issues of pronouncing the Aranda words from their spelling in this dictionary should consult the separate Pronunciation Guides provided at the front of the dictionary in this book. Readers who wish to learn to use the current spelling of Aranda words should consult the modern dictionaries and other resources.

The first Arandic orthography for practical use emerged with the establishment of the Hermannsburg mission in central Australia in 1877 and the subsequent codification of the language in a range of written materials. The name of the language came to be written as 'Aranda' at that time, and this convention is followed throughout this chapter. The orthography, which I shall call the 'Mission Orthography', evolved over time and endured for around a century as a means of written communication for speakers of the Western Aranda language. The Mission Orthography was phonetic in character and was subject to the limitations

1 With contributions, and editing, by John Henderson.

of that type of orthography. It was finally replaced in the 1970s by basically phonemic orthographies, the type currently used for writing all the languages of central Australia. The two modern orthographies for the Western Aranda dialect are called here the Finke River Mission (FRM) orthography and the Institute for Aboriginal Development (IAD) orthography (which follows the Common Arandic approach).[2] The language name is written *Arrarnta* in the FRM orthography and *Arrernte* in the IAD orthography. This chapter does not seek to address all the issues involved in community, institutional and individual choices between these two modern Western Aranda orthographies. See Breen (2005) and Kenny (2017b) for discussion of some of the relevant issues. Kral (2000) discusses the use of literacy in the Western Aranda community.

The Mission Orthography was developed as a practical orthography for use in the Lutheran Western Aranda community, and was used in educational and religious works, a scholarly grammar and dictionary, and in personal correspondence. It was a regular orthography in that it attempted to consistently represent the sounds of Aranda, at least as they were perceived by the missionaries.

In contrast, some other early attempts to write Aranda words were basically ad hoc spellings of each word. In most cases, they were almost certainly intended to give only a rough indication of the pronunciation of just a few words rather than to establish a spelling system for extended writing for a range of purposes. Willshire (1891), and some others, made short wordlists with just a few items, without regular spelling across the words in the list. For example, Willshire gives 'Quasha Un-jew-ma' for what is written as *kwatja ntjuma* 'drink water' in the modern FRM orthography. This example illustrates some common properties of ad hoc spellings of the era. Firstly, these spellings were often based on hearing the words as sounds of English and applying the English orthography. Secondly, a given sound may be represented differently in different words: Willshire's <sh> in his 'Quasha' and his <j> in 'Un-jew-ma' actually represent the same sound (consistently represented by <tj> in the FRM orthography). Thirdly, ad hoc spellings sometimes relied on the spelling of specific English words, such as *Jew* here. Given that the English orthography is moderately irregular, with complex relationships between

2 Using the names of these institutions is just one way that the two orthographies are labelled. There is of course a more detailed history of the people, places and institutions involved. See below, and Breen (2001, 2005).

sounds and letters, the result is a highly irregular system of spelling Aranda words. Finally, hyphens are often used in an unsystematic way to try to compensate for the inconsistency of the relationships between letters and sounds.

The remainder of this chapter examines the details of the letter–sound correspondences for consonants and vowels in the Mission Orthography, and the subsequent development of the later phonemic orthographies. Some technical linguistic terms and symbols are necessary for the discussion but are introduced in a way that will hopefully be useful for a broader readership.

Orthography

Developing a practical orthography, or evaluating one, is a complex matter which involves taking into account the sounds and structure of the language in question, levels of bilingualism in the community, literacy skills in other languages, the functions of literacy in the language, community perceptions of existing or earlier orthographies of the language, social identity, power relations within a community, and other factors. Before considering the details of the Mission Orthography, it is useful to review some concepts which are important to understanding the sound systems of languages and the nature of writing systems. Readers who are familiar with these areas could skip to the next section.

A practical orthography is generally intended as a conventional writing system for everyday community use, that is, where people broadly agree to write the words of a language in the same way. It is a standard which allows individuals to communicate with each other in writing. In general, a practical orthography also aims to be regular or uniform, that is, to be consistent across a language by writing each word of the language according to general principles established for that language. As Gudschinsky (1973: 124) puts it, 'one cannot make an arbitrary decision [on spelling] for each word'.

For regular alphabetic orthographies, the general principles need to specify the relationships between individual sounds and letters. These are often summarised in a general pronunciation key of the kind found in bilingual dictionaries, grammars and language learning materials, as opposed to having to indicate the pronunciation of each word separately.

Some alphabetic orthographies are highly regular in that the relationships between sounds and symbols are essentially one-to-one, that is, each letter (or specific combination of letters) represents a single sound, and each sound is represented by a single letter (or specific combination of letters). The more regular an orthography is, the simpler its pronunciation key. If an alphabetic orthography is not very regular, it will not be straightforward to accurately pronounce a word from its spelling, or to accurately write the word from its pronunciation. Users of the orthography then just have to learn the idiosyncratic spelling of each word.

Establishing a regular alphabetic orthography requires identifying the sounds in all the known words of the language before any decisions can be made about how letters can be assigned to these sounds. In contrast, an ad hoc spelling of a word is typically produced without considering what sounds need to be represented in words overall, and without considering the overall regularity of the orthography. An ad hoc spelling may seem simplest for a limited purpose—just a few words, perhaps a name, or for a sign—but it does not take into account the broader issues in the learning and development of literacy in a community. Such inconsistent spellings may make it harder for people other than the writer—the community as a whole—to read the word in that specific use. They may also make it harder to learn to read and write in the language because they reduce the regularity of the orthography. Of course, a degree of irregularity is not a fatal weakness in an orthography, as the English orthography demonstrates, but it does affect the difficulty of learning to read and write in the language, especially for a minority language with limited resources.

Sounds and graphemes

The symbols of an orthography are graphemes, and in an alphabetic orthography, these are the letters or specific combinations of letters (and accent marks etc.) which represent the sounds of the language. A standard convention in discussing orthography is to use bracketing notation to distinguish different uses of symbols. Graphemes are represented in angle brackets, for example <sh> in the English orthography, in order to distinguish between the graphemes and the sounds they represent. This bracketing also distinguishes orthographic representation from the use of symbols for other purposes, such as phonetic transcription using the International Phonetic Alphabet (IPA) which is indicated by square brackets, and in which [sh] represents a sequence of two sounds.

At this stage, it is necessary to recognise that the term 'sound' in language actually covers two quite distinct concepts, phone and phoneme. Phonetics considers a sound for its objective physical properties, including how it is articulated by the organs of speech. The term 'phone' is used for a sound in this sense. The physical properties of an individual phone can be described, and can then be represented in transcription by the symbols of the IPA. In that function, the IPA symbols are therefore a kind of shorthand for a description of those particular physical properties. For example, [n] represents a phone that is voiced, a nasal, and produced with the tip of the tongue in contact above the upper teeth. The phone [n] occurs in English, Aranda and many other languages. Phonetic transcription represents the physical events of actual speech, but it can be broad(er) or narrow(er) depending on how precise or detailed the description is intended to be. A phonetic transcription may be narrow or precise enough to represent small differences in the way a single individual pronounces the same word on different occasions. A broad(er) transcription represents only larger phonetic differences.

Phonetic transcription identifies individual phones, but beyond this there is the question of how a language uses its phones to constitute its vocabulary. A central fact in this regard is the way that words of the vocabulary are differentiated by particular phonetic differences in a language. For example, in Aranda there are two phones, represented phonetically as [n] and [n̪] (a diacritic added below plain n). The phone [n] is as described above, while [n̪] is a different phone, a dental nasal, that is produced with the tongue against the back of the upper teeth. The difference between these two phones is used in Aranda to differentiate words of the vocabulary, for example [nəmə] 'sit, be' vs [n̪əmə] 'to rain, to wet (something)'. (These words are written in the FRM orthography as *nama* and *nhama*, respectively.) The difference between [n] and [n̪] is significant in Aranda because it can be the only difference in pronunciation between a pair of words, and is therefore crucial to correctly distinguishing words and their meanings in speech. The difference is said to be contrastive in Aranda.

The same two phones, [n] and dental [n̪], also occur in the pronunciation of English words. For example, 'ten' is typically pronounced [ten] whereas dental [n̪] occurs before the dental [θ] in a pronunciation of words like 'tenth', [ten̪θ] (Cox 2012: 137). Although these two phones occur in both English and Aranda, they are used very differently in English. Unlike Aranda, there are no English words that are differentiated just

by this phonetic difference between [n] and [n̪]. This is never the only difference between words of English vocabulary. This means that in English the difference between [n] and [n̪] is not significant for speakers to differentiate distinct words. The difference is not contrastive in English.

This fact about English can be expressed by recognising [n] and [n̪] as minor variations of the same 'sound' in a special sense. This is expressed in technical terms by saying that [n] and [n̪] are allophones (or members) of the same phoneme in English. Bracketing notation uses slash brackets to indicate when an IPA symbol is being used to label a phoneme. Thus the English phoneme /n/ has the allophones [n] and [n̪] (and others). In Aranda, the fact that the difference between [n] and [n̪] differentiates words is expressed by recognising distinct phonemes, which can be labelled /n/ and /n̪/. In this way, the phoneme concept represents not just what phones occur in a language, but which differences between phones differentiate words of the vocabulary of the language. The way that speakers conceive of the sounds of their language tends to correspond to the phonemes that can be analysed from the phonetic facts of word pronunciation. For example, speakers of English are generally not aware that they are producing different phones [n] and [n̪] in words like 'ten' and 'tenth', and generally recognise these distinct phones as instances of the same sound in some sense. In contrast, speakers of Aranda are quite conscious of the sound difference between words like [nəmə] 'sit, be' vs [n̪əmə] 'rain, to wet (something)'. However, speakers' sense of the distinctness or sameness of sounds is not always exactly the same thing as determining what the phonemes of the language are, and needs to be considered separately in developing an orthography.

Analysis of the phonemes of a language allows the words of the vocabulary to be represented in terms of the phonemes in the word. For example, /ænθɹəpɔlədʒi/ is a phonemic representation of the word 'anthropology' in Australian English. Note that this includes the phoneme symbol /n/, by which there is no indication of the actual detail of pronunciation as dental [n̪] in this context. Speakers unconsciously know that the phoneme /n/ can be realised as the dental phone [n̪] in such words because of the following dental sound /θ/. Such phonetic differences which do not play a role in differentiating words in the language are effectively suppressed in a phonemic transcription. Of course, the concepts introduced in the discussion here are relevant to all the consonant and vowel phones of a language: we have only focused on [n] and [n̪] as an example.

In a phonemic orthography, the basic principle is that each grapheme represents a phoneme, which is sufficient information for speakers of a language to match spelling to pronunciation to identify a word. However, there are also additional factors that can play a role in designing a phonemic orthography, and as a result there is often not always a perfect correspondence between graphemes and phonemes.

These concepts can now be applied to consider the Mission Orthography and subsequent phonemic orthographies.

The Mission Orthography: Phonetic, uniform and continental

The Mission Orthography was developed by Hermannsburg missionaries so that they could translate the Bible and other materials into the local languages (Moore and Ríos Castaño 2018). It followed the 'continental' spelling system, according to Carl Strehlow (Kenny 2013: 98), and was an attempt at a uniform orthography. This was clearly a considered and systematic approach to developing a practical orthography for community use, in contrast to the ad hoc approach of authors such as Willshire, as discussed above. The 'continental' approach categorises the simple vowel phones with the letters <a>, <e>, <i>, <o> and <u>. In general terms, this simple approach offers at least the potential for greater consistency in spelling than trying to categorise the vowels of Aranda according to the many distinct vowel sounds distinguished in English orthography. The options for uniform orthographies available to linguistic and other fieldworkers in central Australia in the late 1800s and early 1900s are discussed in Moore (2013). Edward Stirling, for example, used the Royal Geographical System in the 1896 *Report on the work of the Horn Scientific Expedition to Central Australia* (Breen 2005: 94). The science of phonetics was developing at that time, and this was reflected in the evolving approaches to developing orthographies.

The Mission Orthography was founded in the system used by Pastor Hermann Kempe, and summarised in his phonetic key (1891a: 2). By the time Carl Strehlow was compiling the dictionary, the Mission Orthography was already used in teaching at the Hermannsburg school and in religious services. Primers, a worship book (Kempe 1891b), a grammar and vocabulary (Kempe 1891a) had already been published using it. Strehlow

largely followed Kempe's approach, but made some modifications. Oberscheidt (1991: iii) considers that Strehlow 'continued to employ the basic form of the first orthography, creating a kind of orthographic continuity'. John Strehlow (2011: 739) adds, from a different point of view, that '[Carl Strehlow] did not attempt to modify the problematic spelling used by Kempe'. Strehlow (1908) clarified some points about the Mission Orthography, but did not produce any further explicit discussion of Aranda phonetics or orthography.

Some of the differences in Strehlow's spelling reflect his greater ability to discriminate between sounds than his predecessor's. Some other differences can be attributed to dialect variation, as Kempe and Strehlow consulted different speakers who appear to have pronounced some words differently. According to Kempe (1891a: 1–2):

> The vocabulary is that of the tribe inhabiting the River Finke, and is also, with only slight variations in the dialect, that of the tribes in the MacDonnell Ranges eastward to Alice Springs, but not far westward of the River Finke, and extending southward to the Peake.

Strehlow focused on what he saw as a different dialect, 'to use *Aranda aratja*[3] forms spoken by most of the people on the Station in place of the *Aranda ulbma* used by Kempe' (J. Strehlow 2011: 739). For some words, Strehlow specifies a specific dialect. In Kempe's list there are a number of words that appear to be from dialects away from the immediate Hermannsburg area, but are not annotated as such. In some cases, these differences between dialect forms involve an initial vowel. For example, Kempe gives *auma* 'hear', with an initial vowel, whereas Strehlow gives *wuma* without an initial vowel, and attributes *aūma* to a Northern dialect.

Analysis of the Mission Orthography

This section examines Kempe's orthography and its development in Strehlow's work. The Mission Orthography was a broad phonetic representation, rather than phonemic, in that it did not specifically attempt to represent only those phonetic differences which are significant in Aranda because they differentiate words. The Mission Orthography makes some sound distinctions which are not significant in Aranda, and

3 Carl Strehlow glosses *aratja* as 'straight, upright, just' and *ulbma* as 'tight, narrow'.

does not represent some distinctions which are significant. There are three factors to consider in this. Firstly, there is the question of which phonetic distinctions Kempe and Strehlow were able to discriminate, and whether they could discriminate them reliably in different words. To a large degree this can only be assessed against the fact that all the evidence indicates that the individual sounds of Aranda have not changed significantly since Kempe's time, though some individual words may have changed in their pronunciation over that time. There is evidence that the Hermannsburg missionaries modified the orthography as their ability to discriminate sounds improved. Secondly, there is the question as to whether there are phonetic distinctions which they were able to discriminate, but chose not to represent in the orthography in consideration of other factors. There is unfortunately relatively little recorded information on this point. However, there is some evidence that Kempe was in general conscious of the separate tasks in discriminating the sounds of the language and choosing letters to represent them: 'to make the number of written characters as few as possible, [a long vowel] is indicated by a small stroke over the letter, as [in] *lāda* ['point']' (1891a: 2). Thirdly, even where the orthography makes a distinction between sounds, there is the question of whether it is consistently applied in the spelling of individual words, both in Kempe's and Strehlow's dictionaries and in their other works. Kempe's representation of long vowels, discussed below, is such a case. In addition to these three factors, there is also the usual possibility of an accidental error in writing a word.

Kempe's phonetic key distinguishes 15 consonant graphemes, six simple vowel graphemes (and vowel length) and three diphthong graphemes. He characterises the sounds these represent by making comparisons to specific English spellings in example words, and therefore indirectly compares them to phonemes of English. This is of course appropriate for a grammar and vocabulary published in English. There is evidence of influence from both English and Kempe's and Strehlow's native German in the discrimination of individual phones, in the choice of letters to represent them, and in the choice of the comparison examples in English.

Consonants

The basic phonetic representation of consonant sounds in the Mission Orthography is shown in Table 1, with its correspondence to Aranda phonemes and the modern phonemic orthographies. The following

sections provide more detailed discussion of other specific aspects of the representation, including consonant doubling. This table deals only with consonant phones as they occur singly in words: specific sequences of consonant phones in words are discussed later.

The first column in Table 1 gives a representation of the basic consonant phonemes using IPA symbols. This follows the phonemic analysis of consonants by Breen (2001) and Wilkins (1989). The table then indicates the representation of each phoneme in the FRM (Roennfeldt et al. 2006) and IAD (Breen et al. 2000) orthographies, which differ here in only a couple of respects. The orthographies in Kempe (1891a) and the Carl Strehlow dictionary are listed separately because there is a small number of differences between them. The way that the correspondences between the three orthographies are represented in Table 1 can be understood from the following example. The Mission Orthography (i) does not make the important distinction between the phonemes written as <t>, <th> and <rt> in the modern orthographies, and (ii) it does make a distinction between <t> and <d> which is not significant in Aranda because the difference between [t] and [d] does not differentiate words.

Table 1. Basic consonant phonemes and their orthographic representations.

Phonemes (IPA)	FRM & IAD	Mission Orthography	
		C Strehlow	Kempe
/ p /	< p >	< p >, < b >	< p >, < b >
/ k /	< k >	< k >, < g >	< k >, < g >
/ t /	< t >	< t >, < d >	< t >, < d >
/ t̪ /	< th >		
/ ʈ /	< rt >		
/ c /	< tj >(FRM) < ty > (IAD)	< tj >	< tj >
/ j /	< y >	< j >	< j >
		< i >	< i >
/ l /	< l >	< l >	< l >
/ l̪ /	< lh >		
/ ɭ /	< rl >		
/ ʎ /	< ly >	< lj >	< lj >
/ m /	< m >	< m >	< m >

Phonemes (IPA)	FRM & IAD	Mission Orthography	
		C Strehlow	Kempe
/ ɲ /	< ny >	< nj >	< nj >
/ n /	< n >	< n >	< n >
/ ɳ/	< nh >		
/ ɳ /	< rn >		
/ ŋ /	< ng >	< ng >	< ng >
/ ɹ /	< r >	< r >	< r >
/ ɾ /	< rr >		
/ ɯ /	< h > (IAD)	< ṙ >	
/ ᵖm /	< pm >	< tm >	< tm >
/ ᵗn /	< tn >	< tn >, < dn >	< tn >, < dn >
/ ᵗɳ/	< thn >		
/ ᵗɳ /	< rtn >		
/ ᶜɲ /	< tny >	< kn >	< kn >
/ ᵏŋ /	< kng >		< gn >
/ w /	< w >	< w >, < u >, < o >	< w >, < u >, < o >

In Kempe's phonetic key, he describes 15 consonant graphemes, shown in Table 2, as representing 'primitive' sounds of Aranda, that is, the original sounds of Aranda as opposed to the additional letters <f>, <s> and <z> used to represent sounds in biblical names.

Table 2. Consonant graphemes in Kempe (1891a).

'B b, like b in be'	'N n, like n in near'
'D d, like d in do'	'Ng ng, like ng in ring'
'G g, like g in go'	'P p, like p in pipe'
'H h, like h in here'	'R r, like r in roam'
'J j, like y in year'	'T t, like t in to'
'K k, like k in king'	'Tj tj, like g in gentle'
'L l, like l in long'	'W w, like w in wife'
'M m, like m in more'	

Most of the stop consonants are over-differentiated with respect to the phonetic property of voicing: <b> vs <p>, <d> vs <t>, and <g> vs <k>. In each of these pairs, the sounds are contrastive in German and English, that is they differentiate words, for example as demonstrated by *bush* vs

push, *do* vs *to*, and *kill* vs *gill*. However, these pairs of phones are not contrastive in Aranda, in that there are no such pairs of words where the only difference in pronunciation is the difference between [b] vs [p] etc. It was therefore not necessary to distinguish them in the orthography. This type of over-differentiation is not necessarily a significant issue in an orthography provided that speakers of the language can consistently discriminate such non-contrastive sounds. However, this is often not the case, as noted above for [n] and [n̪] in English. Where two phones, such as [b] and [p], are frequently interchangeable within some words, this raises issues for a phonetic approach such as the Mission Orthography. It would result in multiple spellings of a single word according to the phonetic facts of each occasion of a speaker pronouncing that word. This occurs (perhaps accidentally) where Kempe has two distinct vocabulary entries for what appears to be the same word: *damba* 'loose, breakable' and *tamba* 'loose, shaking, perishable, fading'. The alternative is to make an arbitrary decision on which letter to use on a word-by-word basis, and to fix that as the idiosyncratic spelling of that word regardless of how it is actually pronounced on any given occasion. Kempe and Strehlow have in fact done this in many cases, for example with [b] and [p] in *banama* 'to build, to paint' vs *parama* 'to stop, to bar', where there is not a consistent difference in the first sound. The same applies in numerous words for [t] vs [d] and [k] vs [g]. The effect is that the spelling of individual words is more idiosyncratic, and the orthography overall is less regular.

The <h> in Kempe's phonetic key is unnecessary: it does not represent a contrastive sound in Aranda, and in fact does not appear in any of the words in his wordlist. Strehlow (1908: 698) states explicitly that he does not know the 'consonant h' in Aranda, meaning the initial sound in an English word like 'here'.

Kempe's key clearly recognises that the velar nasal [ŋ] occurs in Aranda and represents it as <ng>. However, this phoneme is represented quite variably in his writings, in part because the ability to discriminate a specific sound can depend on the position it occurs in within a word. In his grammar and vocabulary (1891a), Kempe consistently discriminates the velar nasal when it is the first sound in a word, for example in *ngapa* 'crow'. But his worship book (1891b) shows this phone being represented as <n> at the beginning of words. Compare:

> *Etna najila* 'they are hungry' (Kempe 1891b: 12)
> *Etna ngaiala*. [ditto] (Strehlow 1904: 14)

It would appear that Kempe's ability to discriminate the velar nasal in this position developed over time, but the initial variability on this point can be attributed to the influence of German and English. The velar nasal also occurs in both German and English, however, in these languages the velar nasal does not occur as the first sound in a word, and speakers of these languages tend initially to have difficulty in both recognising and pronouncing it in this position. The influence of German or English though is clearly not the same for everyone in this regard: the same issue with the velar nasal had earlier been encountered by the Dieri mission at Killalpannina but it was nonetheless written consistently by missionary Flierl.

Kempe and Strehlow also use <n> for a velar nasal in two other contexts where the key would mandate <ng>: before or after <k>. They use <kn> or <gn> for the sequence of these two consonant phones in for example *wolkna* 'grave', instead of <kng>, and they use <nk> where the key would have <ngk>, for example in *inka* 'foot'. It is not clear whether these reflect an inability to recognise the velar nasal in these contexts, or reflect influence from English or German spellings such as in *drink/trinken*, or reflect a considered spelling 'shortcut'. It could possibly be such a shortcut because Kempe seems to have been prepared to consider the number of letters required for a spelling, as suggested by his discussion of vowel length (1891a: 2), mentioned above. Further, Kempe's and Strehlow's use of <nk> for /ŋk/ in words like *inka* 'foot' does not distinguish /ŋk/ from the distinct sequence of alveolar nasal plus velar stop /nk/ in words like *imanka* 'long ago'.

Kempe's use of <r> is a complicated case. He uses it to represent three distinct phonemes of Aranda: the retroflex approximant /ɻ/, the alveolar tap/trill /ɾ/ and the back approximant /ɰ/ (discussed below). These phonemes are all represented in distinct ways in the modern orthographies, as Table 1 shows.

Double consonant letters

Both Kempe and Strehlow use double consonant letters in some words, but this does not appear to be consistent. In some cases, it appears to be an attempt to distinguish different phonetic properties, but it is not clear which phonetic properties. Aranda distinguishes dental, alveolar, post-alveolar (retroflex) and palatal places of articulation. Thus there are four lateral phonemes represented by <lh>, <l>, <rl> and <ly> respectively in the modern orthographies. There are four corresponding stops and four

corresponding nasals at these places of articulation. Kempe's phonetic key significantly under-differentiates all these consonants in their place of articulation. Thus his <l> represents all of the four distinct phonemes represented in the modern orthographies as <lh>, <l>, <rl> and <ly> (which he also represents as <lj>). In English and German there is of course only one lateral phoneme, at the alveolar place of articulation, and it is common for speakers of these languages to have difficulty discriminating the other distinct lateral phonemes in Aranda: they tend to hear them all as alveolar /l/. Doubling of consonant letters in Kempe's and Strehlow's work seems to indicate a non-alveolar place of articulation without specifying which one, at least for the nasals. Kempe's vocabulary has an instance, *mballa* 'heat', where doubled <ll> represents a dental lateral (<lh> in the modern orthographies). In Strehlow's dictionary <ll> is not common but those that do occur are split relatively evenly between alveolar, retroflex and dental laterals. The tendency seems clearer with doubling of <n> in Strehlow's dictionary: the instances of <nn> there all seem to be retroflex or dental nasals, as opposed to alveolar and palatal.

The letter-doubling strategy also extends to some instances of <rr>. Kempe uses it in one case to distinguish two words, *garra* 'clay-ground' vs *gara* 'meat' where the former has the alveolar tap/trill /ɾ/ and the latter has the retroflex approximant /ɻ/. Strehlow's dictionary has many instances of <rr> vs <r> but there is no real consistency: both options represent the alveolar tap/trill /ɾ/ and the retroflex approximant /ɻ/ in different words. The modern orthographies both consistently represent the alveolar tap/trill as <rr> and the retroflex approximant as <r>.

Palatal sounds

The palatal[4] sounds are not consistently represented in the Mission Orthography. Kempe's phonetic key only has the palatal stop <tj>, and he thus appears to take the palatal nasal and lateral as a sequence of <n> or <l> respectively followed by <j>. This in itself presents no particular issue for the orthography.[5] More importantly, as noted in the previous section, both Kempe and Strehlow are inconsistent in distinguishing the palatal nasal and lateral from their alveolar counterparts, particularly at the beginning of words: they are written as <n> and <l> respectively in many

4 These are better characterised as alveopalatal but the more general term is sufficient here.

5 In fact T.G.H. Strehlow (1944: 14) later analysed all the palatals in this way as consonant clusters: 'j is very frequently met with as the final element of the consonant combinations lj, nj, tj, tnj, ntj'.

cases. For example, *ninta* 'one' (FRM *nyinta*). In the Luritja words in the dictionary Strehlow takes a different approach, drawing on the Spanish use of a tilde above <n>, for example *ngalatarbañi* 'hereinkommen, come into'. He presumably does not use the tilde in Aranda words because the spelling system for Aranda had already become established in use.

Kempe and Strehlow clearly use <nj> to represent two distinct things, (i) a single palatal nasal /ɲ/ and (ii) a sequence of a palatal nasal followed by a palatal stop /ɲc/, although they both also use <ntj> for the latter in other words. It is also possible that in some cases their <nj> represents a sequence of an alveolar nasal followed by a palatal stop /nc/, since this is known to occur in Arandic dialects. Thus it is not clear how to read <nj> in a given word. For example, Strehlow's <nj> in both *njuma* 'drink' (FRM *ntjuma*) and *itinja* 'near' vs *etintja* 'branch' (FRM *etinya* vs *etintja*).

The velar approximant

There is also variability in the representation of the voiced 'unrounded back approximant /ɰ/ articulated in the velar and uvular regions' (Henderson 2013: 20–21), a phoneme with approximant and weak fricative allophones. This is one of the phonemes that Kempe represented with <r>, for example *ara* 'wrath' (Kempe 1891a: 38). This Aranda phoneme is similar to /r/ phonemes in many modern varieties of French (Henderson and Dobson 1994: 22) and allophones of /r/ in German (Moulton 1962: 35) and it is therefore not at all surprising that German speakers represented this Aranda phoneme as <r>. Strehlow (1908: 699) describes its pronunciation and its representation in his work as follows:

> Den Konsonanten h kenne ich im Wonkaranda nicht, dagegen kommt ein gutturales r vor, das ich im Unterschied zum gewöhnlichen r mit einem Spiritus asper versehe (r). Es erfordert für den Weissen einige Übung, diesen Laut hervorzubringen; man versuche den Laut ch (wie in ach!) mit dem sanften, nicht rollenden r zu verbinden; z. B. rarka zu sprechen rcharka.
>
> [I do not know of the consonant h in Wonkaranda, however there is a guttural r, which in contrast to the usual r, I give with the Spiritus asper ʿ [i.e. ŕ]. For a white person it takes practice to produce this sound. One attempts to make the ch sound (as in ach!) combined with a soft and non-rolled r, for example to pronounce rarka as rcharka.]

The *spiritus asper*, a Latin translation of 'rough breathing', is a symbol < ʿ > which appears in Greek linguistic tradition to indicate /h/, the glottal fricative. The Aranda velar approximant was later represented as <r̲> by T.G.H. Strehlow (1944). In the dictionary, Carl Strehlow also recognises the velar approximant as a distinctive sound in another way, by giving it a distinct place in the alphabetical order, placing the 44 entries after the entries starting with plain <r>. The velar approximant has been gradually lost from Western Aranda speech, and is not represented at all in the modern FRM orthography. Its loss in words has generally resulted in a long vowel sound, which Strehlow represented with a macron, as in *ā* 'anger'.

Simple vowels, diphthongs and semivowels

The representation of simple vowels, diphthongs and semivowels is one of the most obvious differences between the Mission Orthography and the modern phonemic orthographies, and indeed it is the major difference between the two modern orthographies. This section examines the representation of the simple vowels first in the Mission Orthography, and then the phonemic orthographies, before discussing the diphthongs.

The vowel letters in Kempe's (1891a: 2) phonetic key are used individually to represent simple vowel phones (and in some cases semivowels), and in combinations to represent diphthongs. They do not match closely to the phonetic distinctions that differentiate Aranda words, and thus cannot easily be correlated with a phonemic analysis of the vowels.

Simple vowels

Kempe's key to simple vowels is shown in Table 3. Because the phonetic representation in the Mission Orthography is broad, these vowel letters do not represent five specific vowel phones in Aranda. In fact, it is possible to discriminate a wide range of vowel phones in Aranda words. Rather, these five vowel letters represent a categorisation of that wide range of vowel phones into five broad phonetic categories. For a vowel phone in a given word to be represented in writing, the writer has to make a decision as to which phonetic category a particular vowel phone fits into.

Table 3. Simple vowels in Kempe (1891a).

'A a, like a in father, are'	'O o, like o in more'
'E e, like e in there, were'	'U u, like u in dull, or o in more'
'I i, like i in tin'	

The categorisation of vowel phones in this way explains certain types of inconsistency in the spelling of words in the Mission Orthography. Firstly, a vowel phone in a particular word can be borderline between two or more of the five categories, and since writers are basically forced to categorise it, they may categorise the same phone differently in writing the same word on different occasions. Secondly, in any language it is normal that there is a certain amount of variability in the pronunciation of a given word, even by the same speaker. So the same word may have slightly different vowel phones in it on different occasions. These points account for some cases in Strehlow's dictionary where there are two distinct entries for the same word, with a vowel phone represented differently, for example *ritjalama* and *ritjilama* 'see on the go'. In just a few cases, he gives two possibilities in the same entry, for example, *irkulambetninama* or *erkulambetninama* 'preserved'. Thirdly, there can be differences between individuals in how they categorise the same vowel phones, and therefore choose different letters to represent them. For example, Kempe's *ewoluma* 'to lean against' vs Strehlow's *iwulama* are very likely to represent basically the same pronunciation, even though three of the four vowel letters in the word are different in the two spellings. Strehlow and Kempe appear to have made different judgements of the best category for each of the vowel phones in the pronunciation of this word, even though both of them were using the set of letters in Table 3. In all of these examples, it is not that one of the spellings is necessarily an error; this variability in spelling is inherent in the way that the Mission Orthography works.

To turn now to the details of the vowels, Kempe's account of how these letters represent the vowel sounds is rather confused. With regard to the length of the vowel sounds, he describes the simple vowel phones as short; however, the majority of the English vowels that he gives as comparisons are in fact long, at least in modern Australian English: in 'f<u>a</u>ther', 'are', 'were' and 'more'. This is complicated by his statement that the corresponding long vowel phones are represented by a macron diacritic over the relevant vowel letter. Kempe's key gives only one example: *lāda* 'point' where he says that <ā> represents the long vowel as in 'far'. This is then further complicated because, in his vocabulary, very few of the long vowel phones of Aranda are actually represented with the macron. Strehlow's dictionary makes greater use of the macron, with all five vowel letters <ā> <ē> <ī> <ō> <ū>, but it is used infrequently and is used to represent only a relatively small proportion of long vowel phones in words. He also occasionally uses a breve diacritic to indicate a short vowel, for example <ă>.

Kempe's <e> represents a broad phonetic category for which the two comparison vowels are as in *there* and *were*, /eː/ and /ɜː/ respectively in modern Australian English. Providing more than one comparison vowel is entirely consistent with the phonetic category approach since it serves to better indicate the phonetic range of the category. His treatment of <u> similarly has two comparison vowels. In fact, in his vocabulary Kempe also uses <u> to represent a vowel phone like the one in English *dull* in only a few words such as *kumerrama* 'to rise, get up', which Strehlow changed to *kamerama*. Given the spelling of words in Kempe's vocabulary, a better comparison in the phonetic key would have been the vowel in English *put* (and he could also have added 'like w in wife' for <u>). It is also problematic that he gives the comparison vowel in *more* for both <u> and <o>, since this means that the same vowel phone can be represented by either letter. This is presumably because the categorisation as <o> and <u> was not a good match to the actual vowel phones. T.G.H. Strehlow (1944: 8) similarly noted—albeit within his rather different vowel categorisation—that 'it becomes a matter of doubt whether to write u or o in a given instance'.

Simple vowels in the FRM and IAD orthographies

The correspondence between the Mission Orthography and the phonemic orthographies is complex with regard to vowels, and the details are more difficult to represent in a single table than for the consonants above. Table 4 shows the representation of simple vowels in the three orthographies. An obvious difference is that the Mission Orthography makes the most distinctions and the IAD orthography the least. This is a consequence of the phonetic basis of the former versus the phonemic basis of the latter. Another obvious difference is that the FRM and IAD orthographies do not use <o>. More important though than listing the vowel letters used in each orthography, is the fact that each orthography uses these letters in different ways, to represent different types of categorisation of the vowel phones that occur in the words of the language.

Table 4. Basic vowel distinctions in the orthographies.[6]

Mission orthography	< a > < e > < i > < o > < u > < ā > < ē > < ī > < ō > < ū >
FRM orthography	< a > < e > < i > < u > < aa>
IAD orthography	< a > < e > < i > < u >

Sources: Mission orthography: Kempe (1891a) and Strehlow (1910a); FRM orthography: Roennfeldt et al. (2006); IAD orthography: Breen et al. (2000).

The basic correspondence in vowels between the FRM and IAD orthographies is given in Table 5, leaving aside some details for the sake of an overview. The Aranda words in the table can be taken as examples of specific vowel phones and their representation, underlined for clarity. Table 5 shows how in some cases the same phone is categorised in different ways in the two orthographies. For example, the first vowel in the Aranda words for 'foot' and 'east' are categorised differently in the FRM orthography and represented as <i> and <e> respectively, whereas they are categorised the same and both represented as <i> in the IAD orthography. Note that due to the complexity of the correspondences in the table, the details of <e> in the IAD orthography have to be split into two separate parts in the table.

The IAD orthography is based on Breen's (2001) phonemic analysis of Aranda, and the aspect that most results in differences between the IAD and FRM orthographies is that in his phonemic analysis there is a phoneme /ə/ which has a wide range of allophones. This range occurs because /ə/ is much influenced by the articulation of its neighbouring phonemes in a given word. The context information in Table 5 gives the general flavour of how this operates, that is, how a given phoneme is realised as the specific phone in the example words. The main factors involved are the effects of (i) a neighbouring palatal consonant, or (ii) a neighbouring rounded consonant. In relation to the latter, Breen (2001) analyses not only the consonant phonemes listed in Table 1 above, but also a set of corresponding consonant phonemes which can be described as rounded or labialised, and represented in IPA as /t^{w}/ for example. This is pronounced

6 As noted above, Kempe (1891a) also occasionally uses a breve diacritic to indicate a short vowel, for example <ă>. Strehlow uses a circumflex diacritic in a few words, mostly <ê>. It is not clear what this is intended to indicate but he may have been experimenting with making a particular distinction that he decided not to proceed with.

with [w] if it is followed by certain vowels, including a word-final vowel. The IAD orthography represents these phonemes with the plain consonant representation plus <w>, for example <tw>.

Table 5. Vowel correspondences between the FRM and IAD orthographies.

FRM orthography		IAD orthography		Phoneme and context	
arr<u>u</u>a 'rock wallaby'	< u >	(< w >)	arr<u>w</u>e	/C^{w}/	rounded consonant
<u>u</u>ra 'fire' p<u>u</u>rta 'round'	< u >	< u >	<u>u</u>re p<u>u</u>rte	/u/	/u/ in all contexts. Alternative analysis: /ə/ before a rounded coronal consonant /C^{w}/[1]
ntj<u>u</u>ma 'drink'	< e >	< e >	nty<u>w</u>e<u>e</u>me	/ə/	after a rounded consonant /C^{w}/
wurra 'boy'			w<u>e</u>rre		after /w/
ntj<u>w</u>i<u>a</u> 'corkwood'	< i >		nty<u>w</u>e<u>y</u>e		after /C^{w}/ & before /j/
irrauw<u>i</u>a 'weapons'			irraw<u>e</u>ye		after /w/ & before /j/
p<u>i</u>t<u>j</u>ima 'come'			p<u>e</u>ty<u>e</u>me		next to palatal consonant, except before / j /
m<u>i</u>a 'mother'			m<u>e</u>ye		before / j /
<u>i</u>lkuma 'eat'	< i >	< i >	<u>i</u>rlkweme	/i/	before a retroflex consonant
<u>i</u>ngka 'foot'			<u>i</u>ngke		
<u>e</u>kngarra 'east'	< e >		<u>i</u>kngerre		
erritj<u>a</u> 'eagle'	< a >	< e >	irrety<u>e</u>	[2]	vowel at end of word
k<u>a</u>tjia 'child'			k<u>e</u>tyeye	/ə/	next to palatal consonant, except before /j/
k<u>a</u>ra 'meat'			k<u>e</u>re		elsewhere
imp<u>a</u>tja 'track'	< aa >	< a >	imp<u>a</u>tye	/a/	
kw<u>aa</u>rra 'girl'			kw<u>a</u>rre		

[1] Breen (2001) offers these two analyses of the vowel in words such as these examples, depending on some specific details that are beyond the scope of this discussion.

[2] Wilkins (1989) analyses the word-final vowel [ə]~[ɐ] as the /ə/ phoneme. Breen's analysis of word-final vowels is more complex. When a word is at the end of a phonological phrase this non-contrastive and quite variable final vowel is analysed as a non-phonemic vowel associated with the phonological phrase, rather than the /ə/ phoneme.

Sources: FRM orthography: Roennfeldt et al. (2006); IAD orthography: Breen et al. (2000); Phoneme and context: Breen (2001).

Some of the categorisation of vowel phones in the early phonetic orthographies would appear to have been influenced by the native languages of their creators. One result is that the native German speakers Kempe and Strehlow write the language name as Aranda, while the native English speakers Spencer and Gillen write it Arunta. T.G.H. Strehlow (1944: 9) identified a back unrounded vowel [ɑ̣] which he identifies with the <u> in English *cut* and *butter*, and a German short sound, <a> as in *kann* and *Mann*. He notes that 'English research workers regularly identify [this Aranda vowel] with their [<u>] sound, whereas German writers regard it as the equivalent of their a sound'. In German orthography, <a> represents both /a/ and /ɑ/ (as in *Stadt*), a contrast which is not found in English (Moulton 1962: 99).

Diphthongs and semivowels

Kempe's representation of the semivowels /w/ and /j/ shows parallels to both English and German. His 'J j, like y in year' is clearly influenced by his native German, where the similar phoneme is written <j>, rather than the corresponding <y> in English. Strehlow (1908: 699) admits that his predecessors would have done better to use <y> instead of <j> but suggests that it was by then difficult to change since <j> was already in use in translations for the Aranda community. Conversely Kempe's and Strehlow's use of <w> in words like *iwuna* 'what?' shows no influence from German, where <w> represents the phoneme /v/.

Kempe recognises three diphthongs, as shown in Table 6. The letters that he chooses to represent these phones follow straightforwardly from the letters that he uses to represent the five simple vowel phones. The representation of the diphthongs happens to partially match German orthography and partially match English orthography. German has three diphthong phonemes: /aʊ/ written <au>, /ɔʏ/ written <eu> or <äu>, and /aɪ/ mostly written <ei> and <ai>. Both Kempe's <au> and <ai> match the German orthography, although <ai> is actually a less common spelling of the German diphthong phoneme /aɪ/. His choice of <oi> does not parallel German, but it does of course parallel the English representation of the diphthong in words like *coin*.

Table 6. Diphthongs in Kempe (1891a).

'Ai ai, like i in light'	'Oi oi, like oi in oil'
'Au au, like ow in now'	

Strehlow (1908: 698) takes the notion of diphthong slightly differently, adding <ui> and <ua>: 'In the Aranda language, only the following diphthongs are known to me: ai, au, oi, ui, ua. The vowels a and e, e and a, etc., may occur side by side, but are never pronounced as diphthongs'. Kempe (1891a: 2) and Strehlow both use, albeit rather inconsistently, a diaeresis diacritic < ¨ > over a vowel to mark it as distinct from the preceding vowel rather than a diphthong, for example Strehlow's *inkaïmbatja* 'footprint' which is a compound consisting of *inka* 'foot' and *imbatja* 'track'.

Most of the differences in this area within and between the Aranda orthographies depends on two related things, (i) whether a phone is taken to be a vowel or a semivowel (a vowel-like consonant), and (ii) how the syllables within a word are distinguished. By standard definition, a diphthong is a complex sound which can be analysed as a transition between two vowel phones within a single phonetic syllable.

In the Mission Orthography, <ai> and <au> are the only sequences of two vowel letters that represent true diphthongs, that is, occurring within a single syllable. Examples are given in Table 7 below. In words such as *jainama* 'send', the diphthong is followed by a retroflex consonant, and the pronunciation of <ai> actually varies between the diphthong indicated by Kempe and a long [a] vowel, at least in current Western Aranda speech. The modern orthographies treat this variation in different ways.

Table 7. Comparison of diphthongs in the Mission Orthography and modern orthographies.

	Strehlow Dictionary	FRM Orthography[1]	IAD Orthography
< ai >	jainama 'send' inkainama '(to) erect'	yairnama ingkairnama	yarneme ingkarneme
	Emphatic ending, e.g. lai! 'go!'	lhai!	lhaye!
< au >	Emphatic ending, e.g. lakitjau!		lheketyawe!

[1] The absence of FRM spellings of words in this table and the following ones is simply because these words do not appear in any available source that uses the FRM orthography.

In a much larger number of cases, illustrated in Table 8, a sequence of two vowel letters in the Mission Orthography represents a phonetic transition between the vowels of two syllables. For example, Strehlow's *jia* 'story' can be analysed as two syllables [ji:|a].

Table 8. Digraphs in the Mission Orthography and their representation in modern orthographies.

	Strehlow Dictionary	FRM Orthography	IAD Orthography
< ai >	(none)		
< au >	bāuma 'push' lauma 'hide'	pauwuma	paweme laweme
< ea >	erea, iria 'saltbush'		irreye
< ia >	jia 'story'	yia	yeye
< iu >	tākiuma 'spread out'	taakiwuma	takiweme
< oa >	itoa 'bush turkey' nóa 'spouse'	itua nua	irtewe newe
< oe >	ntoérama 'vomit'		ntewirreme
< oi >	boilama 'blow'		pewileme
< ou >	erouma 'shake'	rruwuma	rreweme
< ui >	ruilkara 'bird sp.'		rrewirlkere

In the type above, the IAD orthography, and to some extent the FRM orthography, show a different analysis of phonetic transition between the vowels of two syllables: a semivowel /w/ or /j/ is taken to occur between the two vowels. For example, where Strehlow has <au> in *bauma* 'push', the IAD orthography has <awe> in *paweme*. In this case, the FRM orthography combines both strategies, the sequence <au> plus the semivowel represented as <w>, *pauwuma*. An alternative strategy that is similar to this is also used in some words in the Mission Orthography: the transition between the vowels of two syllables is represented by three vowel letters, as illustrated in Table 9. German orthography also uses the same general strategy, for example in words like *feiern* /faiɐn/ 'celebrate' or *misstrauische* /mɪstrauɪʃ/ 'mistrustful'.[7]

Table 9. Trigraphs in the Mission Orthography and modern orthographies.

	Strehlow Dictionary	FRM Orthography	IAD Orthography
< aia >	taia 'moon'	taiya	taye
< aie >	irkaierama 'fade'		irrkayirreme
< aii >	irkaiirkaia 'faint'		irrkayirrkaye
< aua >	taua 'bag' raualelama 'scatter'	thauwa	thawe rawelhileme

7 Much less commonly, German orthography also uses a semivowel symbol in representing such transitions, for example *Bayern* (Bavaria) /baiɐn/.

	Strehlow Dictionary	FRM Orthography	IAD Orthography
< aue >	rauerama 'disperse'		rawirreme
< aui >	rauilama 'scatter, sow'		rawileme
< eoa >	réoa, reowa 'entry'		rriwe, arriwe
< oiu >	ilboiuma 'deny'		ilpuyeweme

The strategy of a sequence of vowel letters is also applied to transitions between vowels over more than two syllables, for example the three syllables represented by <auia> in Strehlow's *errauia* 'weapons'. Compare IAD *irraweye*.

Note that Strehlow's alternative spelling *reowa* 'entry' in Table 9 exemplifies a combined strategy which parallels the FRM spelling of *pauwuma* with transitional <w>. This occurs in only a couple of other words in Strehlow's dictionary. Overall, these different strategies constitute a degree of inconsistency in the Mission Orthography.

As noted above, Strehlow (1908) also listed <ui> and <ua> as representing diphthongs. In fact his dictionary includes the range in Table 10 below. In terms of Breen's phonemic analysis of Aranda, these all involve the same phenomenon, a rounded consonant, written for example as /t^{w}/ using IPA, represented in the IAD orthography as <tw>. This is pronounced with [w] if it is followed by certain vowels, including a word-final vowel. The FRM orthography also represents this as a consonant plus <w> (except for some words where it has consonant plus <u>, as in *arrua* below). Strehlow is more inconsistent, representing this in different words as consonant plus <w> or <u> or <o>.

Table 10. Representation of rounded consonants in the Mission Orthography and modern orthographies.

	Strehlow Dictionary	FRM Orthography	IAD Orthography
< ua >	lankua 'bush banana'	langkwa	langkwe
< uia >	inguia 'old'	ingkwiya	ingkweye
< wa >	kwata 'egg'	kwaarta	kwarte
< we >	kwenja 'windbreak'	kwintja	kwintye
< oa >	aroa 'rock wallaby'	arrua	arrwe

Use of the Mission Orthography

The Mission Orthography can be examined as a system that developed over its time, and as the predecessor of the modern phonemic orthographies. Its origin and development can be understood in terms of the individuals who contributed to it, notably Kempe and Strehlow, but it must also be considered in terms of its intended users and their responses to it. As already noted, the Mission Orthography was used in educational and religious works, a scholarly grammar and dictionary, and in personal correspondence. It was used by Aranda people, though perhaps mostly within the school and church contexts.

The Mission Orthography was clearly intended to be a practical orthography, and its details were established by Kempe and Strehlow with practical considerations in mind. This is evidenced by Kempe's explicit attempt to keep the 'number of written characters as few as possible' (1891a: 2), and Strehlow's (1908) reluctance to make significant changes to the orthography once it had become established in the Hermannsburg community. There was also recognition of the importance of the broader context of English literacy in Australia in Strehlow's (1908) comment on the greater suitability of <y> over <j> in the Aranda orthography. T.G.H. Strehlow continued that sensitivity to context in justifying his later phonetic orthography (1971: l).

If the importance of making a distinction between a practical orthography for use in the language community and an orthography for scholarly or 'scientific' description of a language now seems obvious, it is because of more than 100 years of experience in the creation of new orthographies, a history in which Kempe and Strehlow played an early role. The tension between the development of a 'scientific' (phonetic) alphabet and a practical writing system can be seen with the adoption, and later abandonment, of the Lepsius Standard Alphabet (1863) for writing the Dieri language at the Bethesda mission, which was also founded by missionaries from Hermannsburg, Germany, in the late nineteenth century. The Standard Alphabet was specifically developed for use with hitherto unwritten languages, as opposed to situations where there was (as with Sanskrit) an existing orthographic tradition. One of the principles of the Standard Alphabet was that 'every sound must be defined physiologically before being given a place in the alphabet'. In the view of Kneebone (2005: 356), the main weaknesses of the Standard Alphabet were the tension between

collectors of data and specialised scientific researchers, together with the complexity of the diacritic system, which gave rise to problems for the 'writer, reader and printer'. A similar story took place later in the Finke River mission's abandonment of T.G.H. Strehlow's phonetic orthography with its rich use of diacritics. Oberscheidt (1991) characterises that change as the rejection of a 'purely academic orthography', a criticism he directs not only to T.G.H. Strehlow's phonetic orthography but to the modern IAD orthography as well.

Scholarly interpretation

Missionaries trained in philology were the primary translators and collectors of linguistic data for scholarly analysis throughout the nineteenth century, but they also benefited from that analysis. Kempe (1891a) explicitly invited scholars to advise him on the analysis of Aranda, and Strehlow had a productive long-distance research relationship with the scholar von Leonhardi. Lepsius ([1863] 1981: 1) claimed that,

> An intimate relation exists between linguistic science and Missionary labours. The latter, especially in new and hitherto unwritten languages, supply the former—chiefly by means of translations. Vocabularies, Grammars and Specimens—with rich, and in some cases the only, materials for further investigation and comparison.

The Mission Orthography was under-differentiated in some aspects and over-differentiated in others. In this respect, it was like other orthographies of that time, for example Black's use of the International Phonetic Alphabet to record a Western Desert language (Black 1915). However, independently of the significance of this under- and over-differentiation for practical use in a language community, in some cases it resulted in misinterpretation of written materials by outsiders, including scholars.

Planert (1907: 552) lists 13 simple vowels, 18 complex vowels (diphthongs) and 3 triphthongs in Aranda—far more than his contemporaries had recorded. His overestimation of the diphthongs was caused by his lack of firsthand experience of the language and his reliance on documents written in the Mission Orthography. Planert also includes <ü> among his vowels, which Strehlow (1908) disputes, and claimed that 'triphthongs are not uncommon'. This may refer to the vowel letter sequences in the printed materials to which he had access and from his language informant, returned missionary Nicolai Wettengel. In response Carl Strehlow (1908: 698) stated:

> I am only familiar with the following diphthongs in the Aranda language: ai, au, oi, ui, ua. While the vowels a and e, e and a etc can certainly occur next to each other, they are never pronounced as diphthongs.

Planert claimed that he did not have access to Kempe's (1891a) grammar, however, J. Strehlow (2011: 962, 1018) believes that Planert relied upon the written language in Kempe's work to make his analysis.

Similar misinterpretation of the Mission Orthography has led in some cases to broader misunderstanding of the language. Alf Sommerfelt's (1938) analysis of Aranda is based upon the work of Kempe and Strehlow, as well as the work of Spencer and Gillen. In an attempt to show how Aranda was a primitive language Sommerfelt claimed that Aranda lacked categories found in Indo-European languages and supported his points with false etymologies (Wilkins 1989: 18; McGregor 2008: 6). One such etymology which involved *nama*, supposedly meaning both 'sit' and 'grass', was based upon an under-differentiation in the Mission Orthography. These are in fact two distinct words, with distinct pronunciations, represented as *neme* and *name* respectively in the IAD orthography.

Major developments in Aranda orthography

From Kempe's establishment of the Mission Orthography, its phonetic basis was seen as adequate for the purpose of practical communication between speakers of the language. They were able to recognise words even though not all the significant sounds of the language were distinguished in writing. Oberscheidt (1991: iv) notes that in reading, 'speakers of the language had continued to pronounce the dentals and retroflexes even when the missionaries failed to provide symbols for them'. This is to be expected for fluent readers because, once fluent, the processes of reading rely more on the recognition of whole words than on composing a word from its individual sounds.

During the period of phonetic orthographies, developments in phonetics and in orthography design increased the ability of researchers to discriminate and represent speech sounds. The Mission Orthography was one of a number of phonetic systems for Australian languages. These include Black (1915) and later, the Adelaide University Phonetic System (AUPS) in the 1930s (Monaghan 2008). T.G.H. Strehlow used a version of the AUPS orthography for his fieldnotes and scholarly works.

He produced an academic description of Aranda phonetics and grammar with a narrow phonetic transcription (1944) which, among other features, distinguished 23 vowel phones [iː ɪ ɪ̈ yː eː ɛː a aː ɑ ɑ̣ ɔː o oː uː ʊ ə ĭ ĕ ă ă̤ ŏ ŭ]. Following standard practices in phonetic transcription, many of these narrow phonetic distinctions were represented using diacritics. A simplified version of this scheme was then used in T.G.H. Strehlow's translation of the New Testament (1956) and in the Aranda Lutheran hymnal (1964). In comparison to the Mission Orthography, this system removed the major under-differentiation of place of articulation in consonants, and modified the categorisation of the vowels. A small sample from the hymnal gives the flavour of this orthography: 'Jíŋaṇa ŋűḷilāā́, Iŋkā́ṭai, Ŋuā́ŋ' Uŋgwā́ŋaṇibĕ́ra'. (IAD 'Yengenhe ngwerlilaye, Ingkartaye, Ngwange ngkwangenhiperre.')

As a practical orthography, however, T.G.H. Strehlow's orthography was disliked by the Hermannsburg mission staff who thought it made it difficult to write Aranda. The extensive use of the diacritics also presented technical issues for the printing technology of the day, and had also caused major delays in the printing of T.G.H. Strehlow's major works (Breen 2005: 94). A revised orthography was used in Albrecht's (1979) catechism, where diacritics played a more limited role, only distinguishing the place of articulation of some consonants, for example 'ṇaṇibera aṭa ragaŋkarauṇa' (IAD 'nhanhiperre athe rrekangkerrewerne'). The fate of the diacritics was sealed by the advent of personal computers, as the early models did not readily handle all the diacritics used for Aranda (Oberscheidt 1991: iv).

The development of the theory of the phoneme extended understanding of the sound systems of languages by expressing which phonetic differences are used to differentiate words in a language. Sounds in a language that are contrastive in this way are expressed as the phonemes of the language. The phoneme concept was used in language description in American Structuralist linguistics, and many Australian linguists were first introduced to it by the first schools of the Summer Institute of Linguistics (SIL), held in Melbourne in the 1950s. SIL linguist Sarah Gudschinsky was instrumental in developing orthographies for languages as a way of encouraging literacy among speakers of those languages. These were based upon the identification of the distinctive phonemes of the language, considering the 'functional load' of each in relation to the whole language system (Gudschinsky 1973: 120). Pastor John Pfitzner, who was based at Hermannsburg mission from 1969 to 1984, attended a workshop run by

Gudschinsky in the summer of 1972–73. Pfitzner reanalysed the sounds of Aranda and created the modern FRM orthography, which then replaced both the Mission Orthography and the later phonetic orthographies. Pfitzner replaced the consonant diacritics with digraphs and reanalysed the vowels (Breen 2005: 95). As no words are differentiated by the voicing of stops, and speakers generally make no distinction between voiced and unvoiced stops, this distinction was no longer represented: the stops were represented as <p>, <t> and <k>, and <b>, <d> and <g> were dropped.

The development of the FRM orthography was paralleled by Breen's phonemic analysis of firstly Antekerrepenhe and then other Arandic languages, and the subsequent development of a phonemic orthography on this basis by the then School of Australian Linguistics (Breen 2005). Through the IAD, Breen and other researchers began to develop orthographies for Arandic languages including Western Arrernte, Eastern and Central Arrernte, Anmatyerr, Alyawarr and Kaytetye. The process involved meetings to consult with speakers of the languages over a number of years. These orthographies are distinct to each language, according to the differences between these languages and the preferences of their speakers, but they all follow similar principles, thus the Common Arandic approach. These orthographies have been used to produce dictionaries including the *Eastern and Central Arrernte to English Dictionary* (Henderson and Dobson 1994), the *Introductory Dictionary of Western Arrernte* (Breen et al. 2000), the *Central & Eastern Anmatyerr to English Dictionary* (Green 2010), the *Kaytetye to English Dictionary* (Turpin and Ross 2012) and the *Alyawarr to English Dictionary* (Green 1992; second edition by Blackman et al., forthcoming).

As summarised above, the most significant differences between the FRM and IAD orthographies of Western Aranda are the representations of vowels and diphthongs. The FRM orthography, and some orthographies in the Common Arandic approach, have undergone minor modifications since their inceptions but are now generally considered to be stable. A change made to the FRM orthography was to drop <o> from the orthography (Roennfeldt et al. 2006), recategorising these vowel phones with the other vowel phones represented by <u>. This brought it closer to the IAD orthography. In Wilkins's phonemic analysis of Mparntwe Arrernte (1989: 78) the phoneme /u/ has allophones [o] [ʊ] [ɔ] [ɔː] and [u] in different contexts. For a short period the school at Ltyentye Apurte

(Santa Teresa) introduced <o> into its orthography, but withdrew it so that there was a consistent orthography for Eastern/Central Arrernte in all the communities in which it is spoken.

Concluding remarks

The Mission Orthography was a uniform phonetically-based orthography of the late nineteenth century which was used for practical purposes by speakers of the Aranda language, both Aboriginal and non-Aboriginal. In the view of Gudschinsky (1973: 117), it is never possible to devise an orthography in a social vacuum, that is, apart from social pressures, for example dominant national languages such as English and their writing systems. This continues to be true for Western Aranda. Major languages impinge upon minor languages, and often force the orthography of the latter to compromise.

In the development of an orthography, the language of the creator is important. This means that we have had to consider German phonology and orthography in understanding how the Mission Orthography was devised by its German-speaking inventors.

The Mission Orthography was in use over a century from 1877 to the 1970s, during which it was a functional means of written communication for those who could understand Aranda, despite distinguishing only a minority of the phonemes of the language. A relatively large amount of material was written in the Mission Orthography, particularly religious materials that were used regularly by the entire mission community, and educational materials. A relatively high degree of consistency in the writing of the language is evident from missionary publications and letters. As a result, there was resistance to changing the orthography when T.G.H. Strehlow developed a phonetic orthography based on the IPA from the 1930s on, in order to publish works about Aranda language and culture. The Mission Orthography of Kempe and Carl Strehlow, and its descendant in T.G.H. Strehlow's phonetic orthography, coexisted into the 1970s when both were replaced by phonemic orthographies.

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