The Range and Diversity of Vocalic Systems in Asian Languages*

1. Introduction

The purpose of this paper is first to present a general overview of the language families of Asia and what is presently commonly accepted as the relationships between these families. The second part of the paper will be concerned with examining the nature of the vocalic systems commonly found in these languages, with a focus on providing an explanation for the two major types of systems that are found, and the phonological devices that languages exploit to maintain and strengthen the patterns that have developed. It will be shown that the major correlate of these differences is primarily a difference in the rhythmic structure of the two language types, on the one hand requiring accent to fall on alternate, evenly timed syllables with relatively simple vocalisms, and on the other requiring accent to fall on sequential complex monosyllables, beginning in some languages with consonants from an inventory of as many as 40-50 different distinct phonemes and followed by one of 50 or more vocalic types. These two accent types, sometimes referred to as syllable-timed and stress-timed have their origins in the underlying internal metronome that governs much of human activity, including the way we speak and the way we organize our music, and thus provide a crucial link between languages and a new theory of music based on the distinctive musical traditions of Asia.

2. The Language Families of Asia

There are five generally accepted major language families in Asia that are relevant to our discussions. I am excluding here several languages or language families that are not directly relevant to our discussion. These are languages which probably have no genetic affiliation with the families I will discuss. The excluded languages and language families are Altaic (including Mongolian, Tungusic, Korean, and Japanese). The families I will include are Austronesian,

* Originally published in: *A search in Asia for a new theory of music (Proceedings of the 7th International Conference of the Asia-Pacific Society for Ethnomusicology)*, ed. by José S. Buenconsejo, 249-270. Manila: University of the Philippines Center for Ethnomusicology. (2003)

Kra-Dai, Hmong-Mien, Austroasiatic, and Sino-Tibetan. Altogether these families comprise nearly 2,000 different languages, spread from the eastern edges of the Pacific Ocean, across all of Southeast Asia, Mainland East Asia, and India, to Madagascar, off the eastern coast of Africa. It is probable that ultimately all of these languages will be shown to have descended from a common ancestor spoken some 10,000 or more years ago, but at the present time the proofs of the relationship are far from available.

2.1 Austronesian

I shall begin with the family closest to home, the Austronesian language family (Maps 1-2). Consisting of over 1,000 distinct languages, this is the family that unites the languages of Taiwan, the Philippines, Malaysia, and most of the languages of Indonesia in a diverse western branch, so-called Western Malayo-Polynesian, which also includes the Chamic languages of Vietnam and Hainan, and Malagasy in Madagascar. Moving further to the east there are many languages along the coastal areas of New Guinea, which along with most of the languages of the rest of Melanesia, and the languages of Micronesia and Polynesia constitute a well-defined subgroup of the Austronesian family called Oceanic.

Map 1: The Spread of Austronesian Languages

Map 2: The Spread of Oceanic Languages

The original speakers of the parent language of this whole great family of languages lived in Taiwan from about 6,000 BP, and eventually began their movement south through the Northern Philippines and into Indonesia about 4,000 BP, and had already reached the Melanesian area by less than thousand years later. Settlements had reached the edge of the Polynesian triangle within the next two thousands years or so, and ultimately occupied the furthest reaches of the Pacific.

2.2 Kra-Dai

The closest relatives to the Austronesian language family are a group of some 50 languages, the largest and most well-known of which is the Tai family

of languages, which extend from Guizhou Province in China to halfway down the Malay Peninsula (Map 3). As described by Edmondson and Solnit (1997:1), there are remnants of Shan settlers from Myanmar still found in Assam and surrounding areas of India. In the east, some Zhuang speakers are found in Guangdong Province in southern China, but the majority of speakers are the Thai of Thailand, the Zhuang of Guizhou and Yunnan Provinces in China, the Shan of Myanmar, the Bouyei of Guizhou Province in China, Vietnam and Laos, the Lao and Tai groups of Laos, the Tày and Nùng groups of northern Vietnam, the Thái Dam and Thái Don (the Black and White Thai) of northwestern Vietnam and China, and the Khamti and others living in Myanmar, Assam, and nearby areas of India.

Map 3: The Spread of Kra-Dai Languages

But the Tai family is the only branch of the Kam-Tai family (Figure 1) whose other branches, Be and Kam-Sui have languages spread from Guizhou to Hainan Provinces in China. Kra-Dai has two other widely dispersed sub-branches, the Hlai and the Kra, again with languages spread from across northern Vietnam to southern China and Hainan Ostapirat (2001).

The family used to be known as the Tai-Kadai family, but I prefer the term given by Ostapirat (2001) who has mostly recently provided incontrovertible evidence of the genetic relationship of the family with Austronesian, a relationship first explored by Benedict (1975) and Reid (1985). The parent of this group was spoken only about 1,000 BC, so must have been a daughter of the group from which the ancestors of the Austronesians left when they sailed to Taiwan several thousand years earlier. An alternate explanation that has been given is that the Kra-Dai speakers are the results of a back-migration to the mainland from either Taiwan or the northern Philippines, a thousand years or more after the first migration into Taiwan (Sagart 2001).

Figure 1: The Kra-Dai Language Family

2.3 Hmong-Mien

The Hmong-Mien language family, formerly Miao-Yao, is a relatively small group of languages, but with many distinct dialects spoken by between six and seven million speakers still residing in China. They are remarkable for their extreme dispersion. “Almost all of their settlements, from as far north as Hubei, just below the Yangtze River, to as far south as central Thailand, are found in remote mountain recesses separated from each other by miles of alien territory” (Ramsey 1987:278-279). Ramsey suggests that the homeland of the Hmong people was possibly in the area of the middle Yangtze River valley, while that of the Mien would have been further east, possibly somewhere in the coastal area of southern China. He characterizes their typology as “typically southeast Asian... [and] close to Tai” (*ibid*. 279). Their genetic relationship to languages outside of their family is still controversial, although some scholars have claimed a closer relationship with the Kra-Dai languages, and ultimately with the Austroasiatic family of languages.

2.4 Austroasiatic

The Austroasiatic languages comprise at least two major families consisting of around 170 languages (Parkin 1971). The larger and better known group are the Mon-Khmer languages. While a few groups live in Yunnan Province in China, most of them are found in areas south of China in Vietnam, Thailand, Laos, Kampuchea, and Myanmar, and as far south as the Nicobar Islands and the Malay Peninsula. The largest and probably best known of these languages is Vietnamese, and its relatively close family of languages, Muong. The other major language is Khmer, the national language of Kampuchea. Mon, once a major language in Myanmar and across much of mainland Southeast Asia is now restricted to a relatively few scattered enclaves in Myanmar and Thailand. Other branches within Mon-Khmer include the Bahnaric and Katuic languages of Vietnam, Khasi in the Indian state of Assam, and the Aslian languages in Malaysia. The other major branch of the Austroasiatic language family consists of the Munda languages of India and Assam.

For over a hundred years, linguists have speculated that the Austroasiatic languages and the Austronesian family share a genetic relationship and constitute a phylum of languages called Austric (Schmidt 1906, Diffloth 1994, Reid

1994, 1996, 1999). The claim is that the ancestors of these two families were a single language, spoken perhaps 8,000 years ago, possibly in the area of the middle Yangtze River Valley, from whence a group of intrepid adventurers moved east to the coast and down to the area near present-day Hong Kong and eventually sailed across to what is now Taiwan to became the ancestors of the Austronesian language family (Map 4).

Map 4: The Spread of Austroasiatic Languages

2.5 Sino-Tibetan

The Sino-Tibetan family consists of around 365 languages, spoken in China, Assam, Tibet, Nepal, Bhutan, and India (Map 5). Although the commonly accepted name for the family implies that there are two major branches, Chinese and Tibetan, modern scholarship suggests that despite its overwhelming numeric superiority, Chinese is not a major branch of the family but just a lower-order sub-branch of the Tibetan group. van Driem (1995) suggests that Tibeto-Burman, the old name for the family, be returned to popular usage. The name Chinese is itself of course misleading, in that it typically refers to Mandarin, and is better referred to as Han. There are, in addition, a number of Chinese languages and dialects spoken primarily in the Zhejiang, Jiangxi, Hunan, Fujian, Guangdong, and Guangxi Provinces of southeast China, which in many respects are more conservative than the northern Han Chinese dialects. These languages are Gàn, Xiāng, Hakka, Wu, Mǐn, and Yuè. In addition to the well-known Tibetan and Burmese languages, another major group of the family is Karenic, spoken primarily in Myanmar and western Thailand. That Sino-Tibetan is also possibly related to the Austronesian language family is the theme of a number of papers in recent years by Laurent Sagart (1990, 1993, 1994, 2001). Sagart proposes that the ancestors of this Sino-Austronesian family constituted a dialect chain spread along the Yellow River Valley in northern China, where they were primarily millet agriculturalists. From the eastern part of the chain, a group moved south along the coast of China to the Yangtze River Valley where they picked up rice agriculture, and eventually moved across to Taiwan to form the ancestors of the Austronesian language family.

Map 5: The Spread of the Sino-Tibetan Languages

3. The Vocalic Systems of East Asian Languages

One may wonder what the relevance of the discussion of the language families of Asia is to a search for a new theory of music. It is relevant in that permeating the 2,000 languages that we have covered is an organizing principle which is directly related to that which permeates all music. If one compares the structures of the Munda languages of India with those of their closest relatives, the Mon-Khmer languages of Southeast Asia, languages which developed from a single common ancestor, one is struck with the extreme differences between them at every point of comparison (Donegan and Stampe 1983).

Table 1 about here

3.1 The effect of falling versus rising accent

What is the explanation for the differences between these two completely different systems? Donegan (1993), upon whose work much of the present material is drawn, believes that opposite rhythmic tendencies in the languages have brought about these completely opposite patterns of organization not only in phonology, but also in morphology and syntax. Munda and Mon-Khmer languages are polar opposites in terms of where accent falls in the phrase. In Munda, it is at the beginning of the phrase and the remainder of the phrase therefore carries a falling accent, thus ´— . In Mon-Khmer languages, on the other hand, phrase accent is at the end, with preceding syllables constituting a rising accent, thus —´. These contrasting dynamic patterns are typical not only of the Austroasiatic language family, they are found worldwide. Chinese and Thai and most of the languages of East Asia have rising accent, while the opposite pattern is typical of the languages of Australia, India, central Asia, and northern Eurasia (Donegan 1993:3).

The Austronesian languages seem to have a rising accent in that they typically display Head-dependent word order, but show many features of falling accent languages, such as verb agreement, suffixation, syllabic canon, consonant and vowel type. Although in Austronesian as well as in Munda languages word structure is typically disyllabic, with vowels in each syllable allowing full

coloring,[1] in the Mon-Khmer languages, as well as in Tai, Chamic, and the southern Chinese languages, word structure is typically monosyllabic, or at best, iambic, having a major syllable, within which any vowel may occur, preceded by a weak, open syllable allowing only an unstressed schwa vowel to occur. Vietnamese and its sister Muong languages have completely lost the initial minor syllable.

3.2 Moras, beats, and measures

Donegan describes how rhythm in music clearly echoes rhythm in language. Both, she claims, are brought about by an internal rhythmic clock or 'neural metronome' which emits a flexible but regular beat upon which we attempt to map the words that we speak. "The shortest rhythmic unit... that is relevant in speech, verse, and song is the time needed to pronounce a short syllable." (Donegan *ibid.* 7). This unit when discussed as a linguistic concept is called a MORA. However, the shortest unit of time required to pronounce an independent (stressed) word is two moras long and constitutes a single BEAT. In Donegan's use, a beat consists of two moras, the first strong, the second weak. So any English disyllabic word such as *baby*, *lazy*, *steady*, *grumpy*, etc., is mapped onto a single beat just as stressed single syllable words such as *babe*, *stead*, *laze*, etc. This is the reason that the vowels in the latter words are typically longer in duration than the equivalent vowel in the disyllabic words, they have a longer time span, that of two moras for their expression. In some dialects, such vowels are split into two with stress on the first syllable, as [stéəd]. "A pair of beats, again ordered strong and weak, combine into a MEASURE, as in English *báby-sitter*, *báby-sit*, *hóuse-sitter*, *hóuse-sit*" (Donegan *ibid.* 7).

3.3 Syllable-timed versus stress-timed languages

Languages of the falling accent variety, such as the Munda languages, which allow a variable number of suffixes cannot neatly fit a single word into a single beat, and therefore allow the syllable itself to become the base for the

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[1] At least in the south of the Philippines there are some languages such as Tboli and Blaan, which appear to have developed more of the characteristics of rising-accent languages with loss of weak vowels in initial syllables, and the creation of word-initial consonant clusters.

rhythmic regularity in the language, with multisyllabic words typically having weak and strong alternating accent across pairs of syllables. Such languages are referred to as SYLLABLE-TIMED languages.[2] The phonetic realization of accent in such languages is usually pitch, since accented syllables can only be lengthened if any other syllables in the same beat are shortened. Languages of the rising variety on the other hand, such as most of the languages of Southeast and East Asia, are STRESS-TIMED languages, with accent falling on the main (sometimes the only) syllable in the word. In these languages the phonetic manifestation of accent is stress. These languages can also lengthen vowels and produce other phonetic affects on both the vowels as well as the consonants to enhance the accent of the syllable. It is these affects that have resulted in the tremendous vocalic variety that is found in the languages of East and Southeast Asia.

Whereas Munda languages typically have vowel systems with only five vowels, as do most of the languages of the Philippines (Reid 1973) and other Austronesian languages of Southeast Asia, with arguably few if any true diphthongs, the stress-timed languages of East and Southeast Asia with words having a single, accented heavy syllable, have a rich and extremely diverse vocalic repertoire. Even the simpler systems in the Mon-Khmer languages often have nine and twelve simple vowels, while Khmer itself is reported to have 30-31 contrastive vowels (Huffman 1978), Chong has 46 vowel nuclei (Huffman 1976:584), and Bruu has been analyzed as having as many as 68 vowels (Thongkum 1989).

The next sections of this paper explore the devices that languages use to accomplish this multiplication of vocalic contrasts.

3.4 Oral vowel contrasts

As noted above, most of the languages of Asia that are syllable-timed, have a relatively small number of simple vowel contrasts, the Austronesian languages, for example, all developed from a simple four vowel system reconstructed as in Table 2.

Table 2 about here

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[2] Syllable-timed languages have a variety called MORA-TIMED languages, but the details cannot be dealt with in this paper (see Donegan *ibid.*:10).

Systems such as this have developed to produce the familiar five vowel systems found in many Philippine languages as well as most of the Munda languages of India, by either fronting schwa ([ə]) to *i* or *e*, by a process of palatalization, or by backing it to *u* or *o*, by a process of labialization, or by lowering it to *a*, by a process which increases its sonority, as in Table 3.

Table 3 about here

More extended systems have developed in a few languages, such as Sora, one of the Munda languages, with nine full vowels, as in Table 4. The most that any Philippine language has is eight vowels (Casiguran Dumagat).

Table 4 about here

In the stress-timed languages of East and Southeast Asia, the vowel systems are often just as complex if not more so. Chinese as spoken in Shanghai, a Wú dialect, has twelve vowels, where *i*, *e*, *ɛ*, *ï*, *ə*, and *a* are all pronounced with unrounded lips, while the others have rounded lips to one degree or another, as in Table 5.

Table 5 about here

The standard Dali dialect of the Bai language, one of the Sino-Tibetan group, also has twelve vowels (Ramsey 1987:290).

A number of languages in Southeast Asia not only use a large number of full monophthongal vowels, but because of the extra time allowed in a stressed syllable, modify the set in various ways. Three of the methods fully exploited in many Mon-Khmer languages are the development of long vowels, as described in 3.5, the breaking of long vowels into diphthongs, as described in 3.6, and by the development of a register system, as described in 3.7.

3.5 Long vowel contrasts

Given the time allowed by the extra mora in a stressed syllable carrying a full beat in the underlying rhythmic system of the language, the simplest way to utilize it is to double the length of a vowel, creating a contrast with short vowels. Shorto (1976) in reconstructing the parent vocalic system for the Mon-

Khmer languages, reconstructs seven short vowels and a corresponding set of seven long vowels. He also reconstructed three diphthongs. It was from a system such as this (Table 6) that the short and long vowels of modern Mon and Khmer developed.

Table 6 about here

Vietnamese also has a similar set of seven short and long vowel vocalic contrasts (but without long *aa*) (Liem 1970). Nyah Kur, the only sister language of Mon, probably excels with nine short vowels and nine corresponding long vowels among its inventory of 42 vowel nuclei (Ferlus 1983).

3.6 Diphthongal contrasts

When a stressed vowel is long, a process known as fortition can take place. This is a strengthening process by which a vowel quality which otherwise would be weakened at the end of the beat is maintained by diminishing it at the beginning of the beat. This vowel breaking is known as DIPHTHONGIZATION. As Donegan (*ibid.* 24) describes it,

> This allows the property that would ordinarily be diminished by that process to be retained in the unaffected part of the vowel. In fact, the property that is diminished in one half of the vowel is often increased in the other half by a further, 'opposite', dissimilation. For example, when, by delabialization, a long [oː], or [oo̯], becomes [əo̯], the syllabic increases its sonority, and loses its labiality, but the non-syllabic maintains the labiality. An 'opposite' process, raising, may then increase this labiality: [əo̯] → [əu̯]. (Further dissimilative processes may affect the syllabic, eventually yielding [ɑu̯] or [ɛu̯]).

The presence of large numbers of diphthongs of various types are characteristic of many stress-timed languages, including the various Chinese languages, where the term 'medial' refers to the short vowel sound or glide that comes before the main vowel (Ramsey 1987:44). Mon-Khmer languages likewise abound in diphthongs.

3.7 Register contrasts

One of the characteristics of many Mon-Khmer languages is a unique set of vocalic contrasts only rarely found outside the area. It is labeled with the term voice register and results in contrasting sets of vowels whose acoustic qualities have been characterized by Gregerson (1976:3-24), as given in Table 7.

Table 7 about here

Much effort has been expanded in trying to explain the actual articulatory processes which bring about the vocalic effects of register (Pike 1967, Smith 1968, Huffman 1976, Gregerson 1976, Donegan 1993, etc.). It seems probable that register distinctions have arisen when certain vocalic effects associated with the distinction between initial voiced and voiceless consonants are maintained after the loss of the voicing distinctions in those consonants. These effects have to do with the fact that voiced, or lax, or breathy consonants require an expanded pharyngeal cavity, achieved by advancing the root of the tongue and producing a lower fundamental frequency (F0) at the beginning of the following vowel, while voiceless or tense consonants require a restricted pharyngeal cavity and produce a higher fundamental frequency (F0) at the beginning of the following vowel. The former produce what has been called a sepulchral quality on the vowel, while the latter produce a clear, heady, sometimes creaky, quality. The distinction between voiced and voiceless consonants was lost but the difference in vowel qualities associated with them remained, creating two contrasting sets of vowels. Associated with each register are different sets of diphthongs, the explanations for which are provided by Donegan (*ibid.* 33).

The combination of long vowels, diphthongs, and register have produced a wide range of contrastive vocalic nuclei in Bru, one of the Katuic languages of the Mon-Khmer family (Diffloth 1983). This language has 11 short vowels, 10 long vowels, and 16 diphthongs, distributed across two registers as in Table 8 (acute accents mark first register vowels, grave accents mark second register vowels).

Table 8 about here

3.8 Tone contrasts

Register contrasts, as described above, developed in many Mon-Khmer languages, and also in Western Chamic, an Austronesian language in Vietnam (Edmondson and Gregerson 1993), as a result of the transfer of the articulatory features of consonants unto the vocalic nuclei of the syllable, which were then

retained as contrastive features of the vowels once the distinctions that gave rise to them in the consonants were lost. The same processes operated in the Chinese languages, the Hmong-Mien languages, and in other languages such as Vietnamese and the Chamic languages on Hainan which have been under the influence of Chinese to produce the vocalic pitch contrasts which are referred to as 'tone'. But whereas it was primarily the influence of the initial consonants of a syllable that resulted in register contrasts, both initial and final consonants affected the pitch of syllables and produced tonal contrasts (Ramsey 1987:139).

This was first demonstrated for Vietnamese by Haudricourt (1954) and was subsequently shown to be also the source of tonal contrasts in the Chinese languages. Matisoff (1973:73) explained it in an insightful parody as follows,

> In the beginning was the... monosyllable, arrayed in its full consonantal and vocalic splendor. And the syllable was without tone and devoid of pitch. And monotony was on the face of the mora. And the Spirit of Change hovered over the segments flanking the syllabic nucleus. And Change said, "Let the consonants guarding the vowel to the left and the right contribute some of their phonetic features to the vowel in the name of selfless intersegmental love, even if the consonants thereby be diminished and lose some of their own substance. For their decay or loss will be the sacrifice through which Tone will be brought into the world, that linguists in some future time may rejoice.
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> And it was so. And the Language saw that it was good, and gradually began to exploit tonal differences for distinguishing utterances—yea, even bending them to morphological ends. And the tones were fruitful and multiplied, and diffused from tongue to tongue in the Babel of Southeast Asia.

In Utsat, an Austronesian language of Hainan with five tones, for example, it has been demonstrated that "high tone derives primarily from words with final PAN [Proto-Austronesian] *–q*.... Rising tone is found in words derived from those with PAN final stops (*–p*, *–t*, or *–k*) and with a retained initial consonant that reflects a PAN voiceless stop or PAN continuant.... Falling tones developed regularly in those cases where the word had a PAN final stop and the medial consonant was a voiced stop...." (Maddieson and Pang 1993:84-86).

Thurgood (1998:7) demonstratives, however, that it is not simply final consonants themselves that affect the pitch of vowels, but the laryngeal activity associated with them, "Only those postvocalic consonants whose articulation involves some sort of distinctive laryngeal gesture contribute directly to the pitch pattern." Similarly, he shows that initial consonants themselves do not

produce pitch distinctions, but rather voice quality distinctions of the type that show up as register in other languages, and that these register distinctions are what ultimately are phonemicized as pitch distinctions (Thurgood 1998:8).

While Standard Chinese only has four tones, “the further one travels south of the Yangtze River, the more tones one hears in the Chinese dialects along the way” (Rasmey 1987:36). In most of the dialects of Yue (Cantonese), “there are eight or nine tones, and as many as ten tones in Yulin and Bobai of Guangxi Province” (Zhan 1981:166). The Hmong dialects which are dispersed in the area also have eight tones (Ramsey 1987:282). The Tai languages that are in contact with the southern Chinese dialects similarly have large numbers of tones. The Zhuang dialects which belong to the Tai family all have between eight and ten tones (Zhang and Fei 1997:87, Wei Feng and Edmondson 1997). The development of tonal systems has spread as far west as Bai with eight tones (Ramsey 1987:290) and most of the Tibeto-Burman languages also have between four and seven tones, although some have none.

The development of the tonal systems from systems which were originally non-tonal has been clearly demonstrated although the details of the developments in individual languages are still the focus of intensive investigation by phoneticians, historical linguists, and others.

3.9 Nasality contrasts

The ability of consonants at the beginning and end of a syllable to affect either directly or indirectly the quality of the vowel has been discussed above with reference to the development of voice register and tonal systems. A further type of vocalic contrast found in many Asian languages that is the direct result of the articulatory characteristics of certain final consonants is the contrast between nasal and oral vowels. In the Wu dialect of Shanghai Chinese, for example, a syllable can only end in a vowel, glottal stop, or the velar nasal [ŋ]. However, in the speech of many people, the final nasal consonant is no longer heard, but the vowel itself is nasalized (Ramsey 1987:92-93). Nasalized vowels occur also in some of the Hmong dialects which have lost all final consonants, but only retain vowel nasalization where other dialects have final nasal consonants. Among the Austroasiatic languages, Nicobarese has also developed a set

of nasalized vowels. Nasalization of vowels is also found among the Tibeto-Burman languages.

Nasu (Ramsey 1987:254-5), one of the Loloish languages of Tibeto-Burman, is an example of a typical Asian language with a wide range of initial consonants—44 in all—articulated at seven points of articulation, with contrasting voiced and voiceless aspirated stops and affricates, and contrasting sets of voiced and voiceless nasals and laterals. All the consonants except glottal stop can only occur at the beginning of a syllable. Nasu also has a rich vowel system, with ten basic vowels: *i*, *z* (or *r*), *e*, *a*, *ər*, *ɔ*, *o*, *u*, *ɨ*, and *ə*. Each of the vowels can also be pronounced with distinctive nasalization, the remnants of final syllable nasal consonants which have now disappeared: *ĩ, z̃, ẽ, ã, ər̃, ɔ̃, õ, ũ, ɨ̃,* and *ə̃*. In addition, Nasu has seven distinctive tones: (1) high level, (2) high-mid rising, (3) mid-level, (4) mid-rising, (5) low-falling then rising, (6) low-falling, and (7) 'checked' mid-falling.

4. Vocalic Systems and a New Theory of Music for Asia

As noted earlier in this paper, there are two clearly different rhythmic patterns found in the languages of Asia, a syllable-timed accent pattern which characterizes the present-day Munda languages, and most of the island Southeast Asian Austronesian languages, including those found in the Philippines, and a stress-timed accent pattern found elsewhere. The source of the differences is in what has been called falling accent with accent occurring at the beginning of the phrase, versus rising accent with accent occurring at the end of the phrase. The languages of East and Southeast Asia, particularly the Sino-Tibetan, Hmong-Mien, Mon-Khmer, and Kra-Dai languages, are primarily of the latter type with stress-timed accent patterns.

It should be emphasized that the accent patterns that have been described are universal, in that they are based ultimately on the internal metronome that creates the timing unit or mora and each of the phonological processes that have brought about the rich diversity of vocalic systems in Asian languages briefly described in the previous sections are completely natural. When Matisoff in the quote in §3.8 referred to the "Spirit of Change," he was of course speaking metaphorically, there was no conscious, or deliberate, attempt by an-

yone, or anything, to bring about these systems. Examples are readily found of similar processes in African, European, and American languages.

Bust it is, nevertheless, true that the Asian languages are distinctive among the world's languages. The mainland East and Southeast Asian areas are recognized as forming a *Sprachbund*, or "linguistic area", with a whole range of phonological, morphological, and syntactic identifying characteristics, all of which ultimately depend on the switch from an earlier syllable-timed accent system to the strongly stress-timed accent system now found in these languages, with concomitant development of a large numbers of vowels, the register systems, and ultimately a full range of tonal contrasts.

We are left with a question: To what extent has this set of features, particularly the phonological and rhythmic ones that characterize this linguistic area, affected the musical traditions of the area? It seems to me that just as the characteristics of the languages are the unique expressions of the natural, underlying phonological processes that bring about the richness of vocalic expression, the characteristics of Asian music are just as much the unique expressions of the underlying musical processes that permeate the inner being, and that ultimately have their same source as those that motivate language development.

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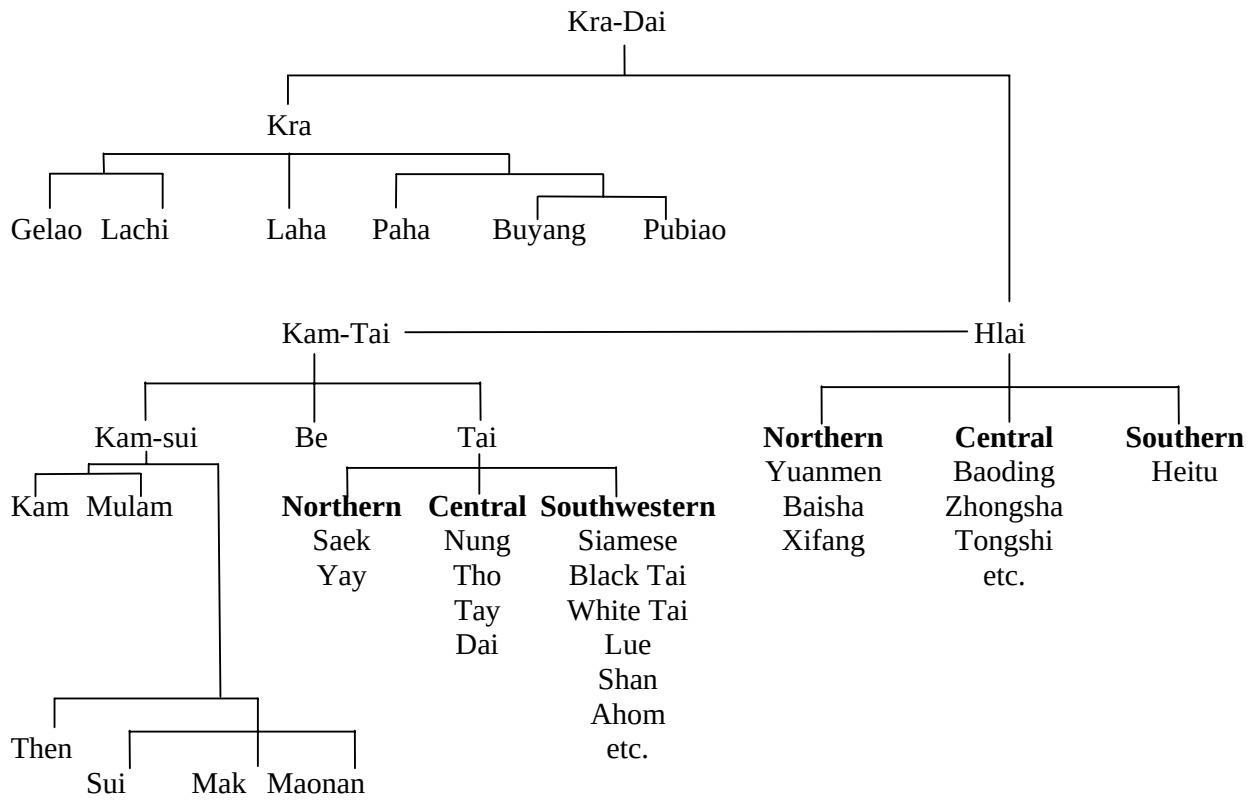
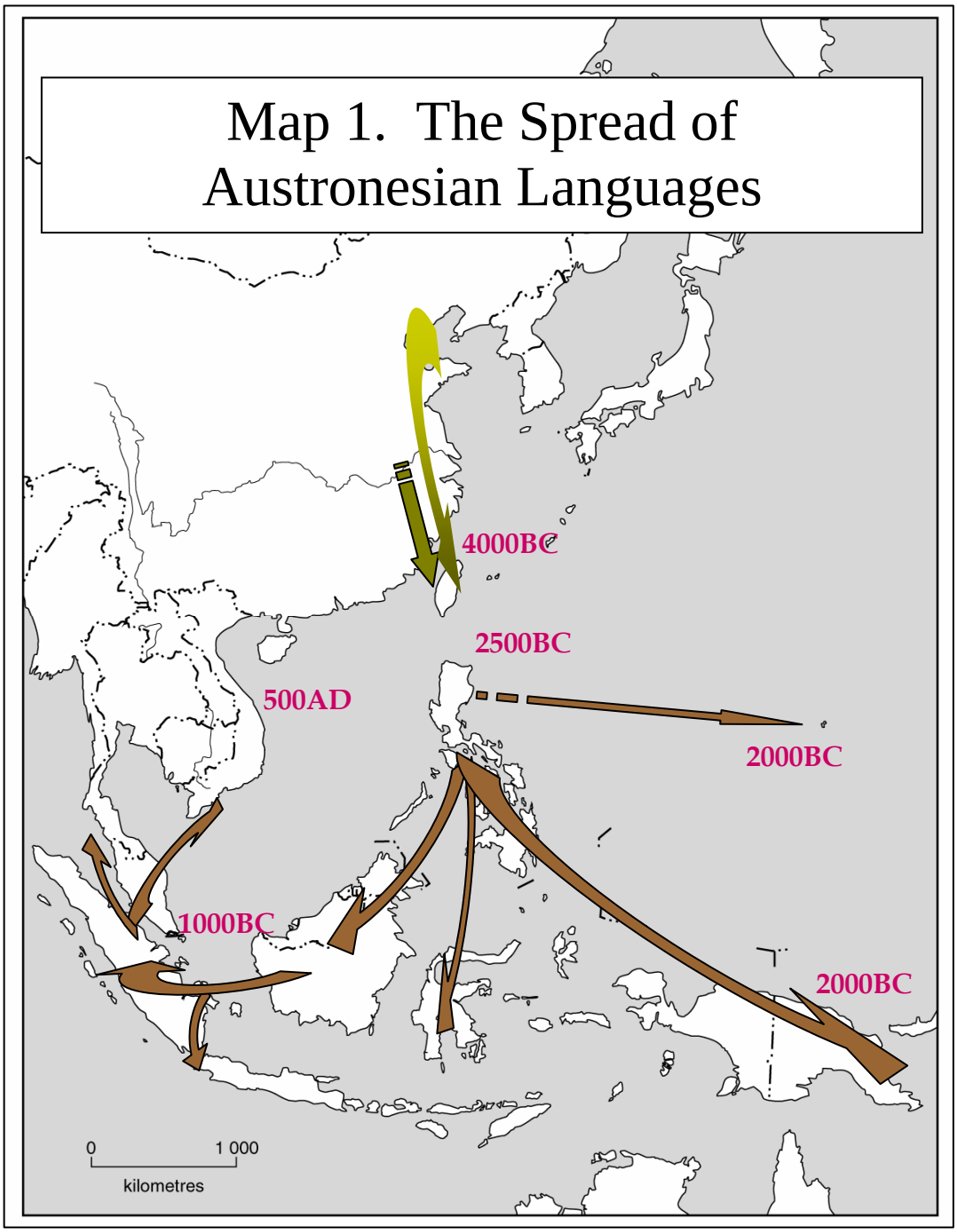
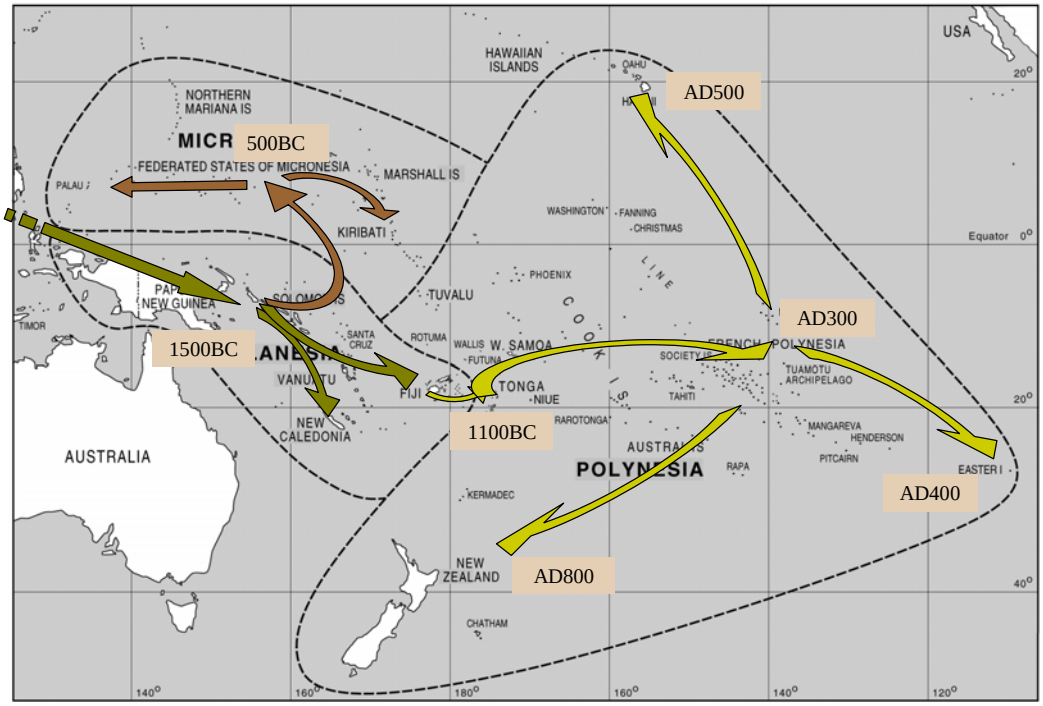


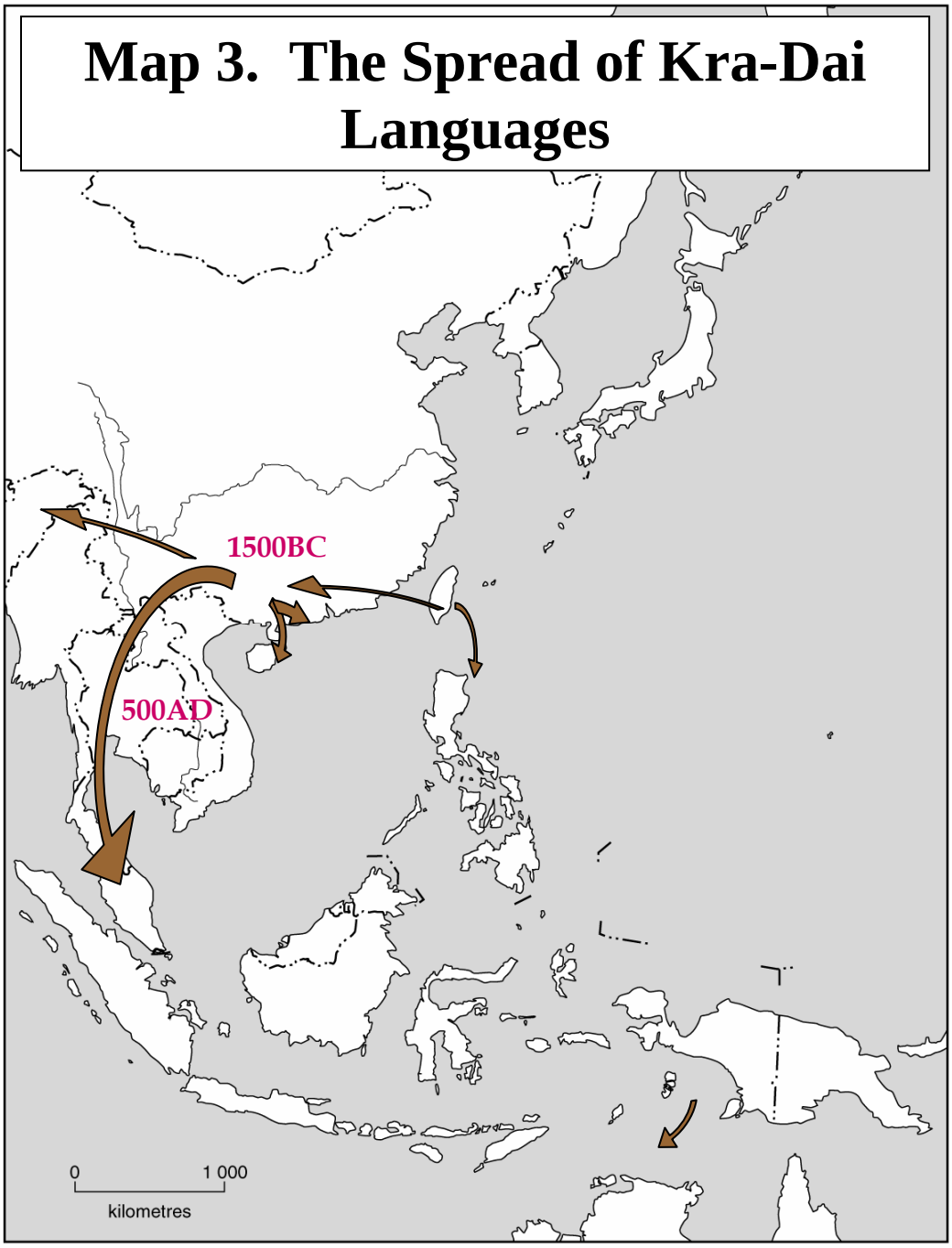
Figure 1. The Kra-Dai Language Family (adapted from Ostapirat 2001)


Map 1. The Spread of Austronesian Languages
4000BC
2500BC
500AD
2000BC
1000BC
2000BC
0
1 000
kilometres

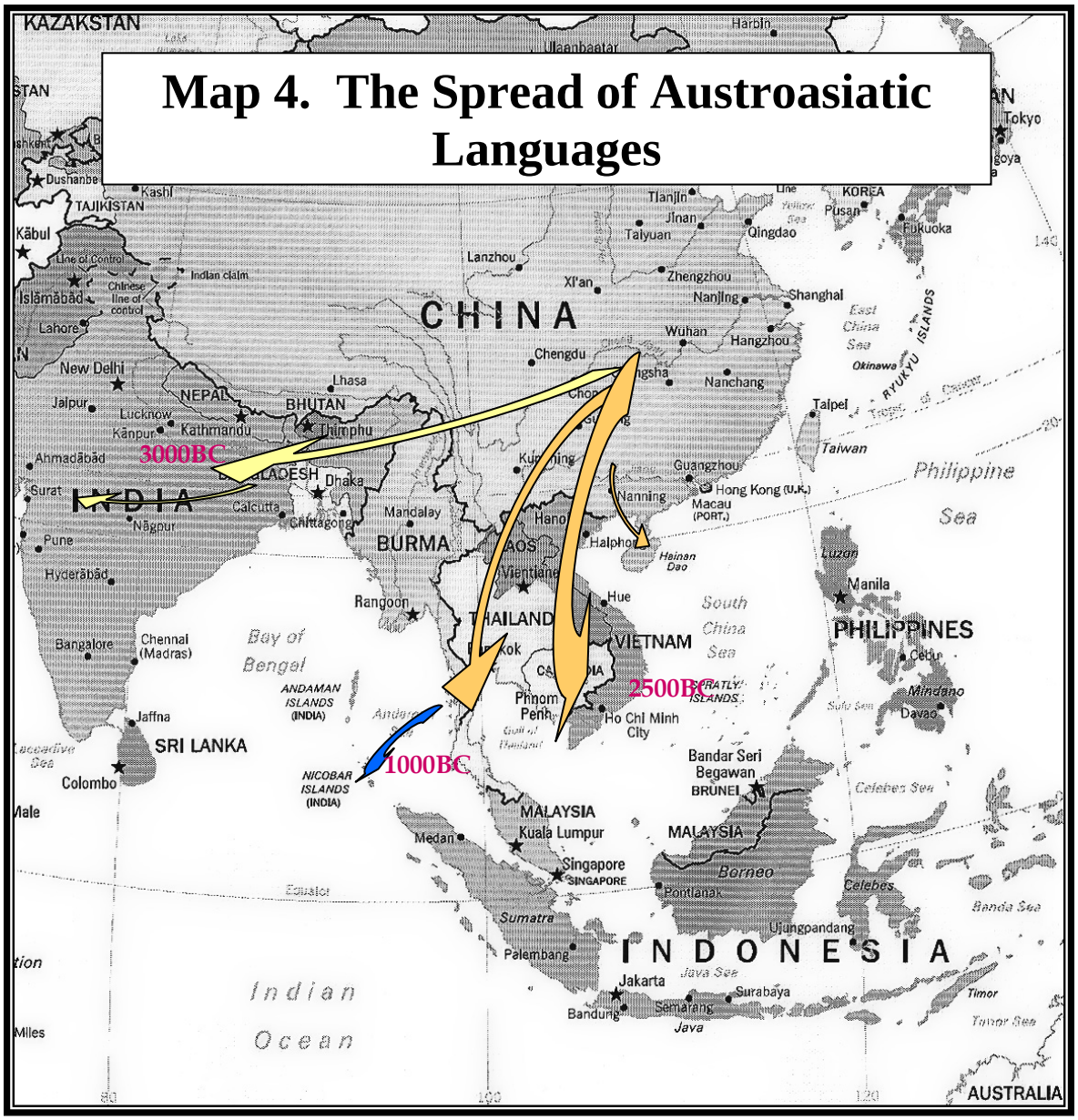
Map 2. The Spread of Oceanic Languages



Map 3. The Spread of Kra-Dai Languages



Map 4. The Spread of Austroasiatic Languages



Map 5. The Spread of Sino-Tibetan Languages

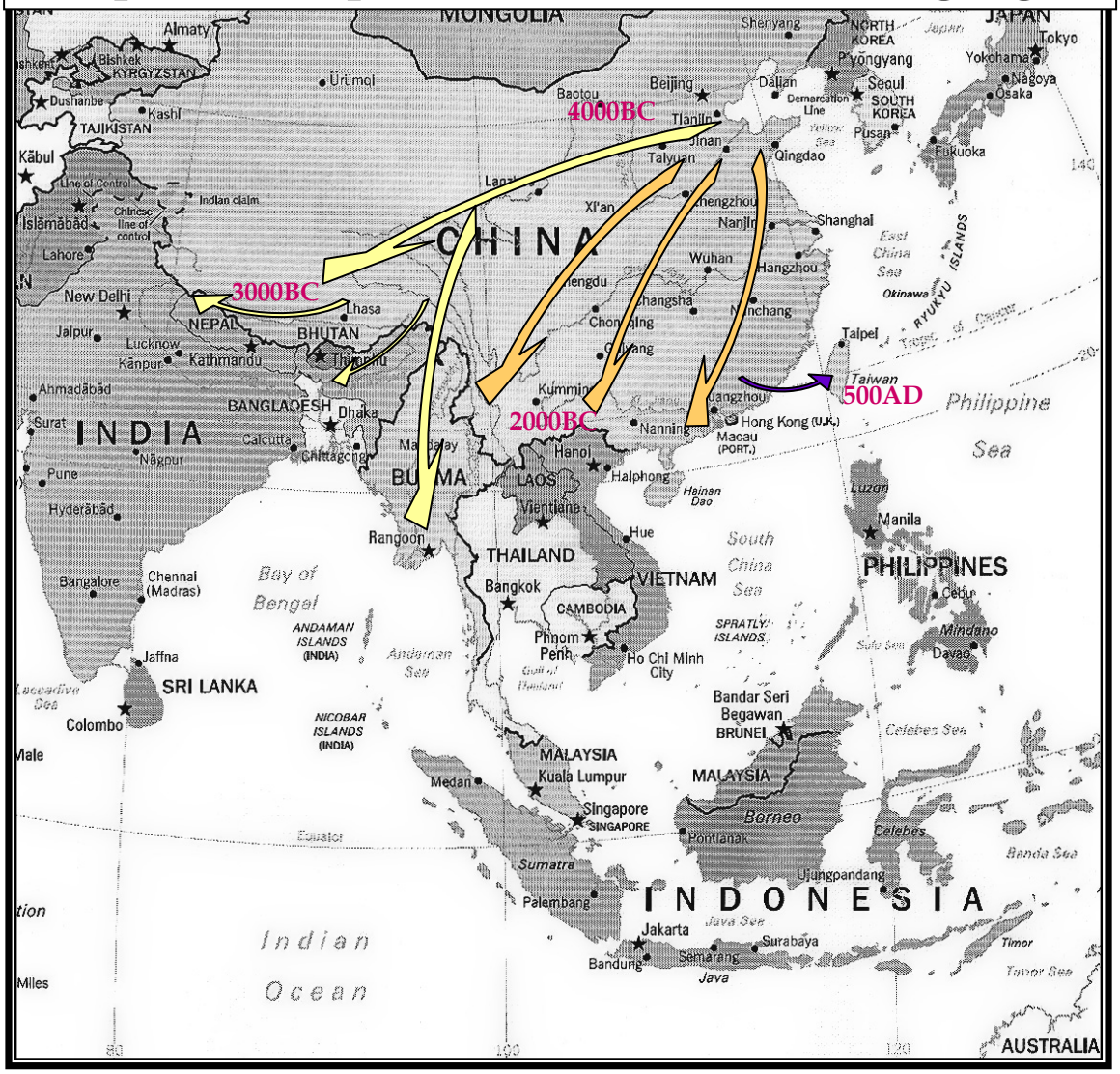


Table 1. Differences between Munda and Mon-Khmer Languages

	Munda	**Mon-Khmer**
phrase accent	falling (initial)	rising (final)
word order	dependent-head (SOV, Adj N, postpositions) variable	head-dependent (SVO, N Adj, prepositional) rigid
syntax	case, verb agreement	analytic
word canon	trochaic, dactylic	iambic, monosyllabic
morphology	agglutinative, suffixing, polysynthetic	fusional, prefixing, isolating
timing	isomoraic	isoaccentual
syllable canon	(C)V(C)	(C)V or (C)(C)V(G)(C)
consonantism	stable, geminate clusters	shifting, tonogenetic, non-geminate clusters
tone/register	level tone (Korku only)	contour tones, register
vocalism	stable, monophthongal, harmonic	shifting, diphthongal, reductive

Table 2. Proto-Austronesian Vowel System

	Front	**Central**	**Back**
High	i		u
Mid		ə	
Low		a	

Table 3. Typical Vowel System of Philippine and Munda languages

	Front	**Central**	**Back**
High	i		u
Mid	e		o
Low		a	

Table 4. The Sora Vowel System (Stampe 1963)

	Front	**Central**	**Back**
High	i	ɨ	u
Mid	e	ə	o
	ɛ		ɔ
Low		a	

Table 5. The Shànghǎi Vowel System (Norman 198:201)

	Front	Central	Back
High	i, y	ï	u
Mid	e, ø	ə, ø	o
	ɛ		ɔ
Low		a	

Table 6. The Monophthongal Vowels of Proto-Mon-Khmer (Shorto 1976)

	Front	Central	Back
High	i, ii		u, uu
	e, ee	ə, əə	o, oo
Mid			ɔ, ɔɔ
Low		a, aa	

Table 7. Summary of Features Associated with Voice Register

	initial (written) consonant	**Voice Quality**	**Vowel Quality**	**Pitch**
First Register	(original) surds	normal head clear tense	more open, on-glided	relatively higher
Second Register	(original) sonants	deep breathy sepulchral chest relaxed	close, centering diphthongs	relatively lower (larynx also lowered)

Table 8. Bru Vocalic Nuclei

simple vowels						**in-gliding diphthongs**							**diphthongs and long vowels**					
i		ɯ		u		íʌ	iɛ	úʌ	ùə	úʌ	úɔ		éi	ìi	ə́ɯ	ùɯ	ʌ́u	ùu
e		ə		o		éa	ia			óa	úa		ɛ́e	èe	áɯ	ə̀ə	óu	òo
ɛ		ʌ		ɔ											ɛɛ		ɔɔ	
	a		ɒ												aa		ɒɒ	