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FROM THE MOUNTAINS TO THE VALLEYS

Understanding ethnolinguistic geography in Southeast Asia

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Introduction

The worldwide distribution of ethnolinguistic diversity is highly uneven and concentrated in particular regions; sub-Saharan Africa from Nigeria to Chad, Melanesia, much of the New World and Southeast Asia. Although the question is frequently posed as if explaining such diversity was the problem, the question is better reformulated in terms of models to explain uniformity. The underlying pattern is diversity, but ethnic homogeneity has developed in particular regions usually by the expansion of one group and its assimilation of its neighbours.

The causes of such expansions are by no means obvious; why have the Kikuyu expanded to over a million while their closely related neighbours have remained in the thousands, or the Khalkh Mongols overwhelmed the other speakers of Mongolic languages? In many cases the answer is undoubtedly military; the Romans eliminated diversity in Europe by conquest and enforced a distinctive culture everywhere they conquered. Even so, military cultures do not come out of a vacuum, but are born in appropriate social and environmental conditions. Apart from the expansion of particular ethnic groups, there is the related question as to what distinguishes these from the expansion of a phylum. Polynesian, Turkic, Bantu and Berber all represent subphylic expansions without any individual language becoming dominant.

One pattern dramatically illustrated in Southeast Asia is the expansion of a single ethnolinguistic group to outnumber all related languages in its region. The interest of this pattern is that it seems to be quite ubiquitous in the region and not elsewhere replicated. This chapter will argue that this type of expansion is linked quite specifically to lowland rice cultivation and the conjunction of mountainous terrain with flooded lowlands, that is, to geography. Much of the archaeological debate on rice systems focuses on the genesis of states or otherwise. But the evidence

is that the agronomic system can override socio-political considerations, that whatever the surface social organisation, the expansion of rice and associated habitat conversion continues relentlessly.

Since the majority of these expansions took place in eras without historical documentation, they are accessible principally via archaeology and historical linguistics. The second part of the chapter examines the reconstruction of terminology associated with rice in the various language phyla of Southeast Asia. It uses comparative vocabulary sets, particularly those collected in Revel (1988) to gauge the extent to which rice-associated words can help interpret the ethnodemographic pattern described. It is striking how many claims about the links between phylic and agrarian expansion are framed in terms of general hypotheses and do not examine the lexical evidence in enough detail to ascertain whether it really provides the expected support.

The chapter largely excludes island Southeast Asia with the exception of Taiwan. Rice is dominant in much of the Philippines and as far as Java and Bali in the Indonesian chain. East of this region, other types of swamp agriculture, based on taro and other tubers, takeover and rice becomes insignificant in subsistence terms. There is probably no good agronomic reason for this; it is rather a reflection of the original history of domestication of these species of tuber and the limits of their historical spread. Once tuber-based swamp agriculture is predominant, the ethnodemographic pattern of a single group taking control of a whole ecozone disappears and linguistic fragmentation becomes the norm.

Historical demography of Southeast Asia

Southeast Asia is, broadly speaking, a region of great ethnic diversity. Unlike the colder regions of inner Asia, numbers of languages in relation to geographical area are very high, as are human population densities. In contrast to other regions of high diversity such as South America, New Guinea or Nigeria-Cameroun, the absolute size of minorities is also large; China has 'minorities' of several million. Southeast Asia also displays an unusual pattern of extreme numerical imbalances between a dominant group and minorities within a region, as the analysis of human population figures in the modern nation-states shows. Table 2.1 shows the countries of Southeast Asia with absolute numbers and populations of minorities and dominant groups as well as the percentages these represent.

Obviously the nation-state is not an ideal analytic tool, since many international boundaries are quite recent. However, more than elsewhere in the world, present-day nation-states *do* represent the approximate sphere of influence of large ethnic groups and these may be incorporated into the name of the country. Moreover, many states are defined significantly by river basins, either by dividing the basin of one large river (in the case of the Mekong) or encompassing a series of parallel rivers as in Myanmar. The figures fall within a limited range with minorities representing 0.1–4.5 per cent of the modern-day state and dominant groups up to 99 per cent of the population. The large size of minorities in

Table 2.1 Nations of Southeast Asia with role of dominant ethnolinguistic group

State	*Total population*	*No. minorities*	*Dominant group*	*No. speakers in dominant group*	*% Total*	*Mean size minority*	*Minorities as % of dominant*
Cambodia	10,716,000	19	Khmer	5,932,800	55.4	265,733	4.48
China	1,262,358,000	201	Han	1,033,057,000	81.8	1,146,505	0.11
Laos	5,163,000	82	Lao	3,000,000	58.1	26,704	0.89
Malay Peninsula	10,115,000	39	Malay	7,181,000	47.0	77,211	1.08
Myanmar	44,497,000	108	Burmese	21,553,000	48.4	214,430	0.99
Taiwan	21,507,000	22	Han	21,157,880	98.4	16,625	0.08
Thailand	60,300,000	75	Thai	45,815,000	76.0	195,743	0.43
Vietnam	77,562,000	93	Vietnamese	65,051,000	83.9	135,989	0.21
Total	1,492,218,000	639		1,202,747,680			
Means	186,527,250	80		150,343,460	68.6	259,867	1.03

Source: Figures from Grimes (2001).

China and their small size in Taiwan somewhat distorts the figures; otherwise for mainland Southeast Asia the figures would be even more homogeneous.

The geographical pattern is almost equally clear-cut; the great majority of the river basins and flood plains are occupied by a single ethnic group; the same one dominant in individual states. Such groups live by a single system, lowland rice cultivation, partly irrigated, partly capture of natural flooding. The remainder of the population, almost all, inhabits the mountainous regions and depends mainly on slash-and-burn agriculture. The broad assumption is that mountain agriculture and high levels of ethnic diversity were the norms in prehistory. Surprisingly, there is an almost complete absence of evidence for hunter–gatherer sites in the swampy lowlands and lacustrine flood plains of Southeast Asia (Higham 1989: 90). Pre-agricultural sites seemed to be confined to limestone rock shelters and coastal sites inhabited by fishing-peoples and aquatic produce collectors; the mangrove site of Khok Phanom Di is a striking example of the richness of this habitat. Only when rice, with its high yields, high digestibility and potential for multiple annual crops, was developed did the lowlands become attractive to inhabit. Even then, irrigation was limited; natural flooding and dry-season recession rice predominated.

Southeast Asia represents a major confluence of language phyla and recent research has tended to show that these phyla are all distinct. Hypotheses that used to link several phyla together are now regarded with some scepticism as much that was thought to be cognate vocabulary now appears to be ancient loanwords. Nonetheless, there may be arguments for higher order linkages as some chapters in this volume suggest (cf. Starosta (Chapter 11), Sagart (Chapters 9 and 10), Reid (Chapter 8)). The relative antiquity of these phyla is also under discussion; older research tended to assume that Sinitic (Chinese) was very ancient because of the continuity of material culture from the Neolithic; but it now seems that a greater ethnolinguistic diversity, previously characterised the region and has been assimilated by Sinitic culture and language.

One thread through this complex story of movement and interaction is the spread of rice cultivation; it can also connect past and present and help interpret the synchronic pattern of languages. Archaeology and linguistics combine to tell a story based on current evidence, acknowledging that archaeology is highly dynamic and that new finds may well alter our perception of chronology quite profoundly. This is not the first attempt to develop this narrative. Spencer (1963) describes the initial movement of rice into Indonesia and Snow *et al*. (1986) into the Philippines. Hanks (1972) and Watabe (1985) present overviews of rice ecology and dispersal in Southeast Asia. Zide and Zide (1976) reconstructed rice vocabulary in Munda while Hill (1977), Glover (1985) and Sorensen (1986) explored the issue from a historical point of view. Pejros and Shnirelman (1998) summarise some of the recent archaeological literature, as well synthesising the literature in Russian. Vovin (1998) used Japonic reconstruction to build hypotheses about the origin of rice cultivation in the Japanese islands.

Rice cultivation

Oryza is a worldwide genus with edible seeds that must have been collected in the wild since the evolution of hominids. It is often considered to have been domesticated twice,[1] once in the Southeast Asian region and once in India (see discussion in Crawford and Chen Shen 1998, Khush 1997, also Oka 1988). Sato (1996) has argued that the perennial *Oryza rufipogon* is ancestral to *japonica* and the annual *O. navira* gave rise to *indica*. Chen and Jiang (1997) report on rice remains before 8,000 BP at Jiahu in Henan in Central China.

Whether or not double domestication occurred, rice has developed a remarkable phenotypic diversity. Cambodia, for example, is considered to have over 2,000 rice varieties that are unique to the country. There are also two key groups of cultivars in terms of cooking quality, sticky and non-sticky rices. Sticky, glutinous rices appear to be more archaic and are still preferred in rural areas, but non-sticky rices are more widespread and more saleable (Roder *et al*. 1996).

Rice is also highly adapted to different agronomic strategies. Dry, upland or hill rice is extremely widespread throughout the region despite being very low-yielding compared with paddy rice. White (1995) argues that upland rice is a secondary development from wetland rice, although this proposition may simply be an artefact of the sites for early rice. The deepwater rices are adapted to sudden flooding and can grow very quickly to outpace a rising river. Bangladesh is known for these cultivars but they occur throughout the region, albeit in small numbers. However, most common are the lowland rices, either irrigated or fed by rain and natural or managed flooding. These are often cultivated in association with ducks or fish and occasionally mixed with taro or lotus. Naturally flooded rice still predominates throughout the region, although irrigation is providing a growing percentage of all output. Even within floodland rice there are divisions between those who use bunded fields (where yields are relatively low) and dry-season flood recession rice (with much higher yields). Irrigated cultivars have been the major focus of attention for the IRRI, which has transformed rice agriculture throughout the region over the last 40 years. Less than 5 per cent of the rice production in Asia is traded in the international market, and China, India and Indonesia account for three-fourths of the global rice consumption. In 1993, rice represented some 88 per cent of all crops grown in Cambodia.

There has been considerable work attempting to date the domestication and spread of rice, most recently reviewed in Crawford and Shen (1998) and for China in Lu (Chapter 3, this volume). The website http://www.carleton.ca/~bgordon/Rice/paper_database.htm provides translations of all the most recent works on archaeological rice in China. Bellwood *et al*. (1992) review dates for Asian rice obtained from pottery temper. They note that it is not possible to be certain that these are domestic rice plants, although the cultural context of each makes this likely. Surprisingly, if it is the case that rice was domesticated twice, once in Northeast India and once in the Yangzi Valley, the grains of both seem to have

Table 2.2 Selected radiocarbon dates for rice in Southeast Asia

Country	*Site*	*Location*	*Date*	*Type**	*Reference*
China	Xianrendong	Jiangxi Province	10,000 to 7,000 BC	I	Yan (1997) (quoted in Sagart 1999)
China	Pengtoushan	N. Hunan Province	6,000 BC	D	Yan Wenming (1991)
China	Hemudu	Zhejiang Province	5,000 BC	D	Chang (1989)
China	Lijiacun	Jiangxi Province	5,500 to 5,000 BC	D	Wu Yaoli (1996)
Taiwan	Ta-p'en-k'eng culture		*c.*3,000 BC	D	Tsang (1992) but see discussion in Bellwood (1997: 213)
India	Khairadih		2,404 BC	?	Bellwood *et al.* (1992)
Malaysia	Gua Sireh	Sarawak	1,950 BC	?	Bellwood *et al.* (1992)
Marianas	Chalan Piao	Saipan	1,733 to 1,263 BC	D	Hunter-Anderson *et al.* (1995)
Indonesia	Sembiran	Bali	790 BC	?	Bellwood *et al.* (1992)

Notes
* D = Direct
I = Indirect
See Crawford and Shen (1998) and Lu (Chapter 3, this volume) for much greater detail on the Chinese sites.

spread and interchanged remarkably quickly. Both subspecies are found in Taiwan. Table 2.2 is a composite of recent sites and dates for rice.

Claims by Yan (1997) for finds of intermediates between wild and cultivated rice in Hunan and Jiangxi have yet to be widely accepted. Nonetheless, barring new findings, a pattern of rice domesticated first in the Yangzi Valley and spreading out from there seems credible.

States and debates

Debates about the prehistory of rice cultivation in Southeast Asia focus on two main issues, the link with language expansion and the role it has played in the rise of state systems. To look at a text like Spencer (1966) is to realise how much our analyses have moved on in recent decades. Spencer realised that there was a correlation between slash and burn agriculture and high ethnic diversity, but he conceptualised this in terms of 'remnant' and 'simpler cultural groups' even though he argued against the pejorative term 'primitive' (op. cit. 19).

Terwiel (1994) has shown the widespread role played by rice in myths of origin through Southeast Asia. Rice irrigation techniques are believed to have been introduced into Cambodia from India *c.*500 AD (Chandler 1993; Mabbett and Chandler 1995). One of the more well-known correlations between state-building and the spread of irrigated rice, the rise of the Angkor between the ninth and Fourteenth centuries, was associated with the construction of reservoirs and irrigation canals along rather Indian lines (Chandler 1993; Grunewald 1992). Fox and Ledgerwood (1999) have argued that the key innovation was dry-season flood recession rice both in Angkor and along the Mekong as far as the delta. This type of rice production is both high-yielding and sustainable. Revisionist historians have proposed that these public works were symbolic and ceremonial but this is more to do with the dynamics of the discipline; once the Angkor kingdom began to fold from the fifteenth century onwards the hydraulic works fell into decay and the Khmer rice farmers, who represented the backbone of the economy, moved to the southeast where conditions were less labour-intensive.

It may be that to understand the present-day ethnographic pattern, the model must be inverted. Typically, rice production is associated with the spread and diversification of a phylum or subphylum. But the reverse may be the case; diversity is the background noise, the Brownian motion of language. Diversification occurs within *any* production system where population densities are low and techniques of restoring soil fertility restricted. Lowland rice cultivation drives the expansion of individual ethnic groups and accentuates their cultural divergence from the main body of a phylum. The typical output is then the single/numerous: many/few pattern observable across the region. Such divergence may then be at the root a state construction, whether a single state (as in Angkor) or a multistate system (as in the Malay Peninsula) (e.g. Allen 1997).

Higham (1998: 74) has a diagrammatic representation of the spread of rice, based on the assumption that it was first domesticated in the Yangzi Valley. This largely follows the view of Blust (1996a,b) and Diffloth (Chapter 5, this volume) that rice may underlie the expansion of Austronesian. In this model, rice spreads out from the Pengtoushan area both south to the China coast and west to the highlands of Laos, where it begins to power the expansion of Austroasiatic speakers. Four arrows, marked Proto-Munda, Proto-Mon, Proto-Khmer, and Proto-Viet carry the rice East, South and West. The following section discusses whether such a model is appropriate in the light of the linguistic evidence. However, it is enough to notice at present that such an approach mixes phylic branches with individual languages, a highly problematic approach in terms both of chronology and interpreting linguistic data.

One of the more surprising aspects of the geography of rice is its diffusion to the Marianas at a very early period (Craib and Farrell 1981). Hunter-Anderson *et al.* (1995) report the site of Chalan Piao on Saipan dated to *c.*3,500 BP. The presence of non-Hispanic rice vocabulary in Chamorro points to an An source, apparently specifically the Philippines (Appendix Table 2.A1). The isolated occurrence of rice in this otherwise sea of vegetative farming systems suggested to the authors that rice was a 'prehistoric valuable' used in exchanges and ceremonial transactions.

Certainly its failure to spread to other regions of Micronesia argues for some type of specialised and location-specific use.

Linguistics and the history of rice cultivation

General

The principle of using the names of cultivated plants to trace their likely routes of introduction has been used within West Africa (Blench 1998; Blench *et al*. 1997) and South Asia (Southworth 1976). In Southeast Asia a major compilation of rice terminology which attempts to lay out both the geography of rice names and to make historical deductions from them is Revel (1988). Given the importance of this document it is more than somewhat surprising that it has not been used in the major texts on Southeast Asian prehistory published subsequently. Revel and her collaborators list seven terms for rice-associated vocabulary by language phylum and analyse the results as well as plotting these terms on an extensive series of maps. Only Japonic and S[illegible]ang[illegible]s other than Sinitic are omitted. These data compilations are the basis of much of the observations that follow, although my interpretations sometimes differ sharply from those in the text.

Evidence for individual phyla

Although there are a variety of hypotheses concerning the higher order or macrophylic relationships of East Asian languages, these remain controversial and there are few crop reconstructions relevant to the present argument (although Sagart, this volume, proposes cognate forms for 'paddy', 'husked rice' and 'Setaria millet' in ST-An). Recognised and uncontroversial phyla therefore remain the unit of analysis. Blench (1999) reviews the recent literature on the classification of the language phyla of the Indo-Pacific region and this will not be repeated here. The principal independent phyla of the region are:

Tibeto-Burman inc. Sinitic
Miao-Yao, also Hmong-Mien
Daic, also Tai-Kadai
Austro-Asiatic
Austronesian
Japonic

The linguistic data available for each phylum and subphylum is analysed below.

Sinitic

The Sinitic languages have a wide variety of terms reconstructible to PS, suggesting knowledge and cultivation of rice at the period of their dispersal. This

Table 2.3 Rice terms in Proto-Sinitic

Transplanted rice-seedling	秧 $yaŋ_1$	Not recorded in OC and perhaps a borrowing from Miao-Yao #ʔʐwɑəːŋ$_A$
Rice-plant	稌 tu_2	OC
Paddy	稻 dao_4	Possibly originally a word for 'husked grain'. Only occurs in scattered modern lects.
Hulled rice	米 mi_3	Applies to millet in northern lects and perhaps
Cooked rice	飯 fan_4	Derived from a verb 'to eat'
Rice soup	粥 $zhou_1$	OC
Food, hulled rice	粲 can_4	OC. A regular nominal derivation from a verb 'to eat', closely resembling Miao-Yao and likely to be a loan into Miao-Yao

Source: Haudricourt (1988) and Sagart (1999: 180–2); Sinitic forms are cited in modern mandarin *pin-yin* transcription.

represents no major deduction, since the archaeology of rice in China suggests dates older than the likely initial break-up of Sinitic. Typical items either reconstructible or attested in OC are given in Table 2.3.

Unless our understanding of the dating of OC is very inaccurate, rice cultivation must have preceded Sinitic expansion throughout much of this region. This supports the scenario outlined by Haudricourt and Strecker (1991: 336) who posited that wet rice cultivation was already in place when the Sinitic expansion began and the Chinese, originally a nomadic pastoralist society, came into contact with and adopted rice early in their career. Haudricourt and Strecker (1991) propose that the incoming Chinese borrowed wetfield agriculture (including 'wet rice-field', 'young rice plant' and 'unhulled rice' and 'flour') from the *in situ* Miao-Yao speakers, but Sagart (1995) has argued that the loans proposed do not stand up under further analysis.

Tibeto-Burman

The phylum conventionally known as ST was characterised as a conjunction of Chinese and the TB languages, that is, all others, of which Tibetan is the most well-known. However, van Driem (1999, 2001) has recently argued that this is a cultural classification and that Chinese should be treated as coordinate with the Bodic languages, that is within TB. This is now called the 'Sino-Bodic' hypothesis. Without passing judgment on this hypothesis, the Sinitic languages, that is, Chinese and its dialects, can be treated as a group, since the Han certainly represent the main numerous, lowland rice-growing population.[2] Sinitic is treated later, but for the rest of TB, the analysis of rice terminology is problematic in the absence of any comparative source.

Miao-Yao

The Miao-Yao are today scattered across the south-central regions of China and into Northeast Thailand and look very much like a refuge population, nearly

Table 2.4 Rice terms in Proto-Miao-Yao

Rice-plant	#ʔʐwɑəːŋ$_A$	Corresponds to OC 秧 *^{b}ʔaŋ 'rice seedling'
Unhulled rice/sticky rice	#mblʊt	Corresponds to OC 秫 *^{b}m-lut 'glutinous millet'
Hulled rice	#tshuəŋ$_B$	Corresponds to OC 粲 *^{a}tshan-s 'fine grain, food'
Cooked rice	hŋaŋ$_C$	Corresponds to OC 饟 *^{b}s-hnaŋ^ʔ-s'food as brought to labourers in the field, soldiers etc.'

Source: PMY forms are given in the reconstructions of Wang and Mao (1995); Chinese forms in the reconstruction of Sagart (1999).

Au: Please provide explanation for note cues a,b.

Table 2.5 Rice terms in Daic

Rice-plant	#ka/ca	Found in Austroasiatic, notably Palaungic and Khmuic
Rice hulled, unhulled, cooked	#xau	Found throughout much of Austroasiatic, notably Vietnamese **gạo**

Source: Lévy (1988).

overwhelmed by the incoming Sinitic speakers. Miao-Yao languages are relatively homogeneous, leading most scholars to assume their diversification is relatively late (cf. Purnell 1970). However, their geographic fragmentation would be better explained by assuming an early date.

The Miao-Yao languages have several roots for rice that appear to be reconstructible to PMY, according to Wang and Mao (1995). These are shown in Table 2.4.

This also suggests that the PMY were familiar with wetfield rice cultivation rather than simply wild rice. Given their location and the clear evidence for rice cultivation in Miao-Yao culture, it may be that they were the original domesticators of rice.

Daic

Daic represents all the languages related to Thai – sometimes referred to as Tai-Kadai in standard sources. Ostapirat (2000) has recently proposed reconstructions for the 'Kra' languages, that is, Kadai, which are evidently rich in agricultural terminology. Table 2.5 shows the Daic rice terminology.

A very distinctive feature of Daic not shared elsewhere in the region is that hulled, unhulled and cooked rice are usually called by the same name. The lack of any very ramified terminology and the astonishing homogeneity between Daic lects argues very strongly that Proto-Daic speakers were not originally rice cultivators and that they borrowed rice from their AA neighbours during an early period of expansion.

Austro-Asiatic

AA lexemes for rice are much more complex than the other phyla so far discussed. Ferlus (1988) does not include the Munda and Nicobarese languages, but fortunately his data can be supplemented by the tables in Zide and Zide (1976). AA is important in the rice debate, because claims have been made for the reconstructibility of rice to PAA (notably in Zide and Zide 1976) and for the role of rice cultivation in the expansion of AA. Gerard Diffloth (p.c.) has kindly made available rice-related reconstructions from his extensive database which give a fuller picture than any published data (Table 2.6).

Ferlus (1988: 87 ff.) notes the high levels of diversity for rice terminology in AA. Zide and Zide (1976) first proposed a 'bimorphemic' reconstruction for Proto-Munda of #ruŋ and #kug for 'hulled rice', combined in some witnesses such as Khmu rŋkoʔ, Brou rakáw and Lawa ləkoʔ. Some of the words for 'rice-plant' seem to be borrowed into Daic, for example #ka, but many have no obvious etymology.

The absence of reconstructions for terms relating to wetfield rice and the presence of terms indicating pounding and swidden agriculture are surely significant. Rice was probably familiar to early AA speakers as a trade good, an opportunistic crop or as a valuable but was not the basis of subsistence. It was only when the wetfield cultivators such as the Viet and the Khmer split off from the main branch of AA that rice became dominant.

Austronesian

Whether the speakers of PAN had rice and if so of what type, is controversial. Most writers accept that AN languages were once spoken in Southeast China (see Chang and Goodenough (1996) for a summary of the arguments) and this has led to the idea that rice cultivation was the engine of early An expansion (e.g. Bellwood 1985: 223). Blust (1976; 1995: 496 ff.), Mahdi (1994), Li (1994) and Wolff (1994) have all discussed the reconstruction of rice terminology in PAN. Three words are reconstructed as PAN (Table 2.7).

At least one cognate set (*Semay 'rice as food') is irregular in Formosan languages and *pajay 'rice plant' may be irregular too, possibly due to interaction

Table 2.6 Rice terminology in PAA

Rice (general)	*ɓa:ʔ	
Rice (general)	*sro:ʔ	Irregular reflexes make this less certain
Husked rice	*rəŋko:ʔ	
Rice-grain	*sŋɔ:ʔ	Reconstructs only to Proto-Mon-Khmer
Also:		
Swidden	*sre:ʔ	
Pestle	*jənre:ʔ	

Source: Diffloth (p.c.).

Table 2.7 PAN reconstructions of rice terminology

	Rice-plant	*Husked rice*	*Cooked rice*
Blust (1976)	*pajay	*beRas	*Semay
Li (1994)	*pag'ey	*beRat	*sem[ae]y
Mahdi (1994: 434)	*pajəi	*BəRas	*Sumai/Həmai
Wolff (1994)	*págey	*beɣás	*semáy

with Philippine languages (Li 1994). Formosan rice terminology is thus variable and uncertain. Mahdi's doublet reconstruction *Həmai, not accepted by other writers, allows him to connect this PAN form with Miao-Yao. However, the only Miao-Yao forms cited in Haudricourt (1988) that resemble *Həmai are the isolated Mien m̥əi and Mun mei, both of which are more likely to be borrowings from Sinitic #mi. Sagart (Chapter [illegible] volume) notes OC ^{b}mə-rat-s and presumably cognate Tibetan 'bras, which he links to An *beRas.

Au: Please specify chapter number for Sagart (this volume).

Once down the An family tree as far as PMP, words associated with rice become very numerous and reconstruction more certain. This situation would be best explained by supposing that the early An migrants to Formosa had both upland rice and millets, but that the millets were central to their agriculture and indeed their ritual calendar (Arnaud 1974, 1988). There would be nothing very surprising about this; hill-rice is a minor opportunistic crop among many mountain peoples in Southeast Asia up to the present. The earliest rice occurs archaeologically at 2,500 BC,[3] first in the Taiwan straits and then in Taiwan proper, rather late for rice to be a key An crop.

Reid (1994) in a detailed investigation of rice terminology among the Cordilleran languages of the northern Philippines, shows that all the terms associated with rice cultivation reconstruct to Proto-Cordilleran, suggesting very strongly that rice cultivation in the northern Philippines was contemporaneous with the first An settlement. This includes the 'pondfield' construction typical of the region that underlies the extraordinary and apparently ancient terraces. Reid (1994: 372) also notes that few terms relating to pondfield construction have external cognates, leading to the conclusion that it was locally developed technology specific to the area.

The 'inland Austronesian' or Chamic languages in Vietnam, such as Jorai, Rhade and Roglai, seem to have largely borrowed their rice terms from Malay (Table 2.8).

Although Moken and the other sea-nomad languages of the Mergui archipelago are An, they have borrowed heavily from non-An languages. The term for 'rice-plant' pai/pie etc. is probably An.

Rice is not generally cultivated in Oceania, but appears to have reached the Marianas as early as 3,500 BP (Hunter-Anderson *et al*. 1995). Nonetheless, Chamorro rice terminology is something of a puzzle. Although the archaeological evidence for ancient rice production on the Marianas appears to be solid, the

Table 2.8 Rice terms in Proto-Chamic

Gloss	*Proto-Chamic*	
Rice-plant	*paday	<Malay **padi**
Glutinous rice	*ɗʲiəp	No external cognates
Husked rice	*bra:s	PMP ***beRas*** also widespread in Sino-Tibetan (Sagart this volume)
Rice wine	*ʔalak	<Arabic perhaps via Malay
Cooked rice	*lasɛy	cf. Malay **nasi**

Source: Thurgood (1999).

Au: Please specify chapter number for Sagart (this volume).

affiliations of its rice vocabulary appear to be anything but archaic. Appendix Table 2.A2 shows these terms and those cognates that have been so far identified; these are suspiciously similar to Ilocano, suggesting not an ancient An link, but rather lexical innovation or replacement from the sixteenth century onwards through contact with the Philippines. Reid (1998) has discussed the evidence for contact between Chamorro and Philippine languages; although the level of contact is significant, its date is hard to determine.

Austric

The Austric hypothesis, a proposed macrophylum that would unite AA and An, although first proposed in 1906, remained largely in limbo until the 1990s when the work by Reid (1996, Chapter 8, this volume) and Blust (1996b) placed it back into serious consideration. Blust (op. cit) has put forward a scenario for the early expansion and spread of these two phyla, emerging from 'the area in which the Salween, Mekong and Yangzi run parallel at their narrowest watershed'. Blust believes that rice domestication is possible at this period but that the extensive exploitation of wild rice is equally likely. Higham (1996a: 71) says quite unambiguously 'the development of rice cultivation in the Yangzi valley took place among people who spoke languages of the Austric phylum' and he reaffirms this view in his interpretation of the archaeological evidence (Higham 1996b, 1998). It is certainly true that there is strong lexical evidence for AA loans into OC (Norman and Mei 1976) but this shows only that now-assimilated languages were once widespread in South China. This is not the place to evaluate the overall hypothesis, but it is important to state that there is no linguistic support for the place of rice in the diversification of Austric. A complete absence of similarities in the rice terminology of the two phyla suggests that rice cultivation emerged only after the two phyla diverged (cf. Table 2.6 and Table 2.7).

Japonic

Japan is a pre-eminent rice culture, but Japan is notable for its lack of ethnic diversity, the only other language in the Japanese islands being the now-extinct

Table 2.9 Proto-Japonic rice terminology

Gloss	*Reconstruction*	*Possible etymology*
Rice-plant	*(z)ina-Ci/ *(h)ina-Ci 2.4	
Unhulled rice	*momi 2.1	
Hulled rice	*dona-Ci 2.1	
(Hulled) rice	*koma-Ci 2.3	Vovin compares to #**com**, proto-Viet-Muong for 'cooked rice' but this seems unlikely because of the change in meaning and the isolation of this term within Austroasiatic
Cooked rice	*ipi 2.3	cf. Palaungic #**ʔəp-** 'cooked rice'
Ear of grain	*pwo 1.3a	
Ricefield	*ta 1.3a	
Rice bran	*nuka ?2.3	
Flour	*kwo 1.3a	
Starch rice	*nori 2.3	
Glue		

Source: Adapted from Vovin (1998: 368).

Notes
Numerical notations represent different PJ noun accent classes (H – high pitch, L – low pitch, X – number of moras in a word): 1.1: H-H, 1.2: H-L, 1.3a: L-L, 1.3b: L-H, 2.1: HH-H, 2.2a: HH-L, 2.2b: HL-L, 2.3: LL-L, 2.4: LH-H, 2.5: LH-L.

Ainu (Hudson 1994). Japanese rice terminology has been investigated by Vovin (1998: 366–78). Japanese lects are extremely homogeneous and indicate that the migrants who brought rice to Japan had fully established wetfield rice. Table 2.9 shows Vovin's reconstructions of Proto-Japonic and some etymological speculations on their external affiliations.

Vovin argues for AA links, but the truth is that most Japonic terms seem to have no external cognates at all. What parallels there are could as easily be early loans as evidence of any cultural affiliation.

Summary of linguistic evidence

The main points emerging from the linguistic analysis are as follows:

1 There are definite similarities between OC and Miao-Yao wet rice vocabulary and there was early interaction between the groups. The direction of loans is debated, but it seems possible that the Miao-Yao or their predecessors were the original domesticators of rice in the Yangzi Valley and were forced into their present-day hill locations by Sinitic expansion.
2 Daic languages show little diversification of rice terminology and clear similarities with their AA neighbours. The homogeneity of Daic suggests an expansion much later than AA and early borrowings into Daic of rice terms.

3 PAA speakers were familiar with rice but it is unlikely that their expansion was initially driven by the adoption of rice cultivation, which may have been an upland crop or even simply a traded valuable. However, AA speakers such as the Khmer and Viet became major rice cultivators as part of the process of diverging from the main body of the phylum. Munda speakers probably also had ric[illegible]en they began to move westward.
4 The An[illegible] seem to have had some form of rice when they began to colonise Taiwan, although evidence for wetfield systems is lacking and they probably cultivated upland rice. Rice systems today in Taiwan have apparently borrowed elements from the Philippines. Rice cultivation really develops once the migrating Ans reach the Philippines; the linguistic evidence appears to point to a largely indigenous development of agronomic techniques.
5 Although there is evidence for ancient rice cultivation in the Marianas, the rice vocabulary in use today seems to come from Philippine languages, notably Ilokano, probably pointing to a major influence of early migrants on a rather marginal crop.
6 Japanese rice systems are largely sui[illegible]eris: few external parallels seem to indicate links with other rice systems. This suggest that however the original mainland Japanese acquired rice agriculture, it was from a now-vanished source.

Building a model

The ethnodemography of Southeast Asia presents a strongly realised pattern of single groups developing irrigated or rain-fed cultivation and expanding into lowland regions previously sparsely populated. The resident groups, presumably fishing-peoples, were driven out or assimilated and marked population increases occurred. Ethnolinguistic diversity was then confined to mountainous regions. It is doubtful if mountains were refuge areas as was supposed in earlier literature; their diversity is 'natural' and the ethnic homogeneity of the lowlands a later development. Modern rice cultivation techniques have tipped this balance still further towards the rice cultivators.

Rice may not have been the direct engine of expansion of any of Southeast Asia's language phyla, despite its dominant role today. In the early period, the two millets, *Panicum* and *Setaria*, were probably the dominant crops with upland rice a minor part of the cultigen repertoire. However, once experience was gained with rice in lowland areas, it functioned as a localised driver of demographic expansion. Hence the pattern of homogeneity in the river basins and coastal wetlands of Southeast Asia. Much archaeological debate has evolved around state formation and irrigated cultivation evidently makes state formation more feasible. But the two are not necessarily connected, as several studies have shown; populations can increase slowly but inexorably within any sort of political context; what counts is the techno-environmental conditions.

Much further work remains to be done, both archaeologically and linguistically, to clarify the picture. In particular, much more rice vocabulary relating to different production systems could help elucidate what type of rice agronomy was adopted by which ethnic group and how such systems spread.

Appendix

Rice vocabularies

Table 2.A1 Rice in Munda languages

Language	*Raw, husked*	*Paddy, unhusked*
Sora	**roŋko**	**səro kondɛm**
Gorum	**rũŋk (-ajaŋ)**	**kundem (-ar)**
Gtaʔ	**rkoʔ /-ro**	**condiaʔ, kia, ya**
Remo	**ruŋku /ŋkuk'**	**kerɔŋ/-ker**
Gutob	**rukug**	**keroŋ/-ker**
Kharia	**rumkub**	**baʔa, bag**
Juang	**ruŋkub**	**bua**
Mundari	**cauli**	**baba**
Santali	**here** (but **ruṛuŋ** 'to husk')	**hurhu, horo**
Ho	**ruuŋ** 'to husk'	n.a.
Korku	**rum** 'to husk'	**baba**
Asuri, Turi	n.a.	**huṛu** ('paddy plant')
Birhor	n.a	**huṛu** ('paddy plant')

Source: Zide and Zide (1976).

Table 2.A2 Rice vocabulary in Chamorro

Chamorro	*Meaning*	*External cognates*
alaguan	Rice soup	cf. Philippines/Borneo languages, for example, Timugon **linagas**
bibenka	Rice-pudding	cf. Ilokano **bibíngka**,
fa'i	Growing rice	reflex of the ***pari**, ***padi** forms found throughout much of the Philippines and Borneo
fama ayan	Ricefield	?
hineksa	Cooked rice	?
potu	Rice-cake	cf. Ilokano **púto**
pugas	Uncooked rice	cf. Philippines/Borneo languages, for example, Ilokano, Timugon **bagás**
timulo	Pile of rice stalks	
tinitu	Hulled rice	cf. Ilokano forms for 'cooked rice' ʔ**inutu** although the initial t- is a problem

Source: Hunter-Anderson *et al*. (1995) and Rubino (2000).

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Abbreviations

AA	Austro-Asiatic
An	Austronesian
IRRI	International Rice Research Institute
OC	Old Chinese
PAA	Proto-Austro-Asiatic
PAN	Proto-Austronesian
PMP	Proto-Malayo-Polynesian
PMY	Proto-Miao-Yao
PS	Proto-Sinitic
ST	Sino-Tibetan
TB	Tibeto-Burman

Notes

1 Africa also domesticated rice quite separately, and *Oryza glaberrima* is a widespread staple in the west of West Africa. However, it is not interfertile with the high-yielding Asian rices, hence these have become dominant in West Africa over the last 50 years.
2 Van Driem (p.c.) notes that there appears to be little in common between Sinitic and other TB rice terminology.
3 A date later than 2,500 BC for alluvium near Tainan has just been reported (Tsang, Chapter 4, this volume).

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