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Foraging–Farming Transitions in Island Southeast Asia

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Abstract The origins of agriculture have been debated by archaeologists for most of the discipline's history, no more so than in Island Southeast Asia. The orthodox view is that Neolithic farmers spread south by sea from mainland China to Taiwan and thence to Island Southeast Asia, taking with them a new material culture and domestic rice and pigs and speaking the precursor of the Austronesian languages that are spoken in the region today. Opponents of this 'farming/language dispersal' theory have proposed models of acculturation, in which foragers acquired new material culture and food resources by trading with farmers. However, new work in archaeology, palaeoecology, palynology and anthropology, especially in Borneo, and in genetics and linguistics for the region as a whole, is suggesting that foraging/farming transitions in Southeast Asia were far more complex than either of these opposing 'grand narratives' of discontinuity (population colonisation) or continuity (acculturation) allows. Through the course of the Early/Mid-Holocene new material culture, technologies and foods were variously taken up, promoted or resisted in order to provision changes in the social and ideological constitution of societies. Whilst new readings of the data for foraging–farming transitions in the region vary, a consensus is emerging that it is more useful to focus on how materials and modes of life were used to underwrite changes in social networks than to seek to explain the archaeological record in terms of migrating farmers or acculturating foragers.

Keywords Early farming · Foraging · Hunter-gatherers · Island Southeast Asia · Niah Caves · Borneo

Introduction

The dominant theoretical framework for considering the timing and character of the beginnings of farming in Island Southeast Asia (ISEA) owes its origins to linguistic

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studies of the Austronesian languages spoken by most of the present-day inhabitants of the region (Fig. 1). By the 1970s, most linguists agreed that the precursor of this language group was likeliest to have originated on the island of Taiwan, the island within the group's distribution with the greatest linguistic diversity, and thence spread southwards across ISEA (Blust 1976, 1988; Pawley and Green 1975; Shutler and Marck 1975). Words and phrases thought likely to have characterised the founder language suggested that its speakers were sedentary pottery-using farmers who cultivated rice and a variety of tuberous and tree crops and kept domesticated dogs, pigs and chickens. Theories of language development indicated that the origins of the Austronesian language might go back at least 4,000 years. Meanwhile, archaeologists were finding sites with Neolithic pottery and polished stone tools, traditionally assumed here as in the other parts of the world to be the material culture of early farmers, in different parts of ISEA. Radiocarbon dates indicated a broad contemporaneity between Neolithic sites in Taiwan and mainland China, around 6000 before the present (BP), and a 'fall-off' thence across ISEA, with dates of *c*. 5000/4500 BP in the Philippines and Sulawesi and *c*. 4000 BP in East Timor (Bellwood 1985; Spriggs 1989). In 1988, Peter Bellwood proposed the hypothesis that the apparent concurrence between the linguistics and the archaeology could be combined in a model of 'demic diffusion' to explain the beginnings of farming in ISEA and the wider Pacific region ('Remote Oceania'): rice- and pig-farming began in mainland China and spread rapidly to Taiwan, whence Austronesian-speaking Neolithic people carried the new lifestyle across ISEA and thence across the Pacific.

When the 'Austronesian hypothesis' for the origins of agriculture in ISEA was first proposed, examples of reliably identified domestic plants and animals from well-excavated Neolithic sites that could provide independent support for the theory were extremely rare, an exception being rice-tempered pottery and rice husks at Andarayan in Luzon in the northern Philippines, the husks yielding a direct ^{14}C date of 3400±125 BP

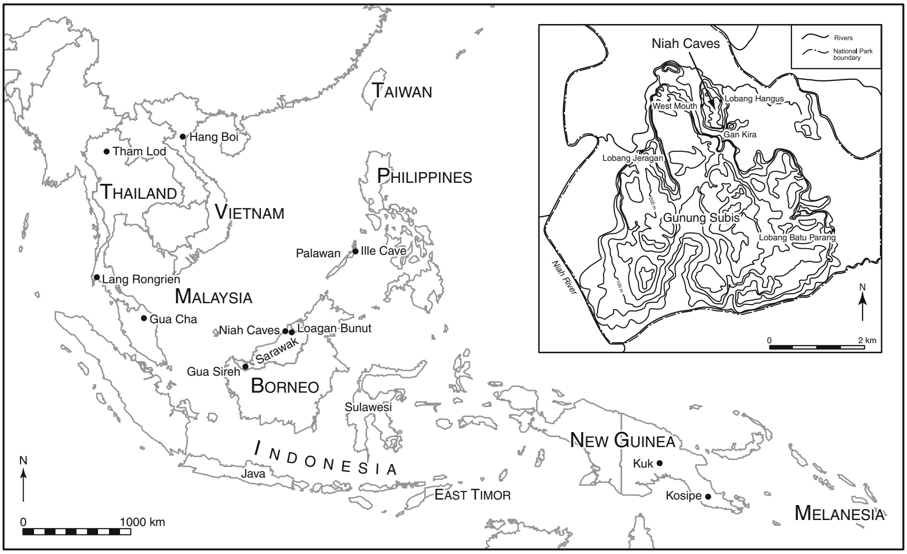

Fig. 1 Island Southeast Asia (ISEA), showing regions, locations and (*inset*) Niah cave entrances mentioned in the text

and charcoal from the site giving another date of 3240±160 BP (Snow *et al.* 1986). In the early 1990s, excavations by Bellwood and Datan in Gua Sireh, a cave in western Sarawak on Borneo, found examples of charred domestic rice, and rice inclusions in Neolithic pottery, in secure stratigraphic contexts with a ^{14}C date of 3850±260 BP (Bellwood *et al.* 1992). These dated examples of rice, together with the appearance across ISEA around 4,000–3,000 years ago of types of material culture defined as typical of Neolithic-farming people, such as red-slipped pottery in a shared repertoire of shapes and designs, and particular forms of stone and shell artefacts, appeared to provide archaeological confirmation for the Austronesian migration model, which Bellwood reiterated and elaborated in ensuing studies over the next two decades (e.g. Bellwood 1990, 1996, 1997, 2004, 2009, 2011; Diamond and Bellwood 2003). Rather as in the parallel model of Indo-European-speaking farmers carrying Neolithic material culture and agriculture from the Near East into Europe (Renfrew 1987), it was assumed that the incoming farmers would variously have avoided, displaced or absorbed the indigenous—non-Austronesian-speaking—population of foragers.

An alternative reading of the archaeological evidence, the 'Nusantao hypothesis', was proposed by Solheim, most explicitly in his 1984 paper, Nusantao being a term constructed from the Austronesian stem words for 'island' and 'people' (Solheim 1984, 2006). In the Late Pleistocene 20,000 years ago global sea levels were some 130 m below present-day levels, and in what is now ISEA the lowered sea level created 'Sundaland', a landmass the size of Europe linking mainland Southeast Asia to the present-day islands from Taiwan in the north to Timor in the south. Holocene climatic warming after *c.* 11500 BP resulted in the very rapid flooding of the Sundaland plains, creating the modern island topography (Hanebuth *et al.* 2000). Solheim argued that foragers (hunter-gatherers) living in this region would have developed an increasingly maritime-oriented culture as huge areas of their landscape were flooded, encouraging the development of cultural and linguistic similarities and the spread of agricultural resources in exchange systems. (He did not attempt to reconcile the Nusantao hypothesis with the demic diffusion model indicated by the linguistics.)

Over the same period in research history, in the 1970s and 1980s, Golson *et al.* working at Kuk in the highlands of New Guinea found evidence indicating that the indigenous population of foragers here gradually developed systems of cultivating root crops such as taro and tree crops such as *Pandanus* during the Early Holocene (Golson 1977, 1985, 1989; Golson and Hughes 1980). This evidence by itself did not directly affect the Austronesian migration hypothesis because New Guinea is largely outside the present-day distribution of Austronesian languages (its languages are a separate group, Papuan), but by the mid-1990s hints of Early Holocene (and in some case Late Pleistocene) tree and vegetable management and/or cultivation were being reported from elsewhere in Melanesia and western Polynesia, within the Austronesian language distribution (Gosden 1995; Gosden *et al.* 1989; Spriggs 1996; Terrell and Welsch 1997; Yen 1993). Bellwood has incorporated this evidence into the Austronesian hypothesis by arguing that some groups of incoming farmers in ISEA may well have adopted practices of arboriculture and vegeculture from contact with indigenous populations, especially in regions where rice was difficult to grow, but reiterating the central core of the thesis, that farming began in the region because Austronesian-speaking farmers spread from Taiwan taking with them a package of new material culture and new forms of subsistence (Bellwood 2011).

The timing and character of foraging–farming transitions in ISEA continue to be one of the most actively debated topics in the region's prehistory, with competing grand narratives respectively privileging notions of discontinuity and continuity and variously incorporating archaeological, genetic and linguistic data sets (e.g. Barton and Denham 2011; Bellwood 2011; Blench 2011; Denham 2011; Donohue and Denham 2010; Kayser 2010; O'Connor 2006; Soares *et al*. 2008, 2011; Spriggs 2011). The organisers of the Nanterre seminar defined four major categories of data with the potential to inform archaeologists about the discontinuous or continuous nature of societal change: cultural practices, including the use of material culture and subsistence strategies; modes of occupation, such as patterns of occupation versus abandonment in settlement sequences and degrees of mobility; demographic fluctuations, as reconstructed for example from regional trends in ^{14}C-dated sites; and patterns in genetic heritage modelled from analyses of modern populations of people, plants and animals and ancient DNA preserved in archaeological materials. In the following paper, we consider the genetic and archaeological evidence for discontinuities and continuities in foraging–farming transitions in ISEA in terms of these four categories of data, but in reverse order, and reflecting in the concluding discussion on the extent to which the increasing complexities of the genetic and archaeological data can be reconciled with interpretations of the linguistic evidence.

Patterns in Genetic Heritage

Initial work modelling human genetic history in ISEA from the genetics of the modern populations indicated that there have been two major population dispersals into the region: an 'Australo-Melanesian' one *c*. 50000 BP and an Austronesian one *c*. 5500–4500 BP (Melton *et al.* 1998; Sykes *et al.* 1995). The earlier one was in accord with theories about the timing of the expansion of modern humans (*Homo sapiens*) out of Africa and into Australasia, the later one with the Bellwood/Blust model of Austronesian agriculturalists. Much work continues to follow this template. For example, Friedlaender *et al*. (2008) argued from patterns of autosomal variation for a strong East Asian/Taiwanese component to Austronesian-speaking Remote Pacific islanders, suggesting that they were almost entirely the result of a Late Holocene expansion from Taiwan that took place with little interaction with New Guinean populations on the way. Kayser *et al.* (2008a, b) also proposed that Polynesians were largely Taiwanese in their ancestry, but with a ~20 % Melanesian component. The Asian/Melanesian dichotomy runs through the work of Kayser *et al*. (e.g. Kayser 2010), but in contrast to Friedlaender *et al*., they have interpreted this pattern as supporting their 'slow-boat' model, a variant of the two-stage model: in this, Austronesian speakers expanded from Taiwan carrying Asian (maternally inherited) mitochondrial DNA (mtDNA) lineages but exchanged their male lineages largely for Melanesian Y chromosomes from New Guinea *en route* (Kayser *et al.* 2000, 2001, 2006). They dated the admixture between 'Borneons' and New Guineans to *c*. 3000 BP (Wollstein *et al*. 2010) but, given that they also estimated a split time between New Guineans and Europeans of *c*. 27000 BP, this figure should possibly be roughly doubled. In any event, Delfin *et al.* (2012) have emphasised that 'Asian' genetic lineages found in the Pacific should not necessarily be assumed to be the result of an Austronesian migration.

There are good reasons for caution. These autosomal studies included few samples from ISEA, and a much more comprehensive analysis came to different conclusions, even suggesting that aboriginal Taiwanese might be an offshoot from Island Southeast Asians (Abdulla *et al*. 2009). More detailed studies of both mtDNA and Y-chromosome distributions confirm that this may be the case (at least in part), and in any event have painted a much more complex picture of the demographic history of the region than the simple two-stage model. Early mtDNA studies concurred with the archaeological picture of settlement by modern humans at least 50,000 years ago (Hill *et al.* 2007; Hudjashov *et al.* 2007; Macaulay *et al.* 2005). This has been further confirmed for ISEA in particular by more recent detailed studies of the phylogeny of 69 complete mtDNA genome sequences from haplogroup M9, whose members occur today in China, Taiwan, Southeast Asia and ISEA (Soares *et al*. 2008). This study identified a probable Southeast Asian origin for M9 *c*. 50000 BP, and an origin for its sub-clade, haplogroup E (which amounts to ~15 % of Island Southeast Asian mtDNAs), most likely within ISEA, in the last 30,000 years. Furthermore, haplogroup E underwent major expansions and dispersals in the Early to Mid-Holocene (taking into account the recalibration of the mtDNA clock: Soares *et al.* 2009), extending west into Malaysia, east into New Guinea and north into Taiwan. Rather than being the major source of Holocene population migrations southwards across ISEA as in the Austronesian model, therefore, Taiwan appears to have been a *recipient* of haplogroup E lineages at least, somewhere between 8000 and 4000 BP. Thus, this mtDNA lineage has revealed much earlier episodes of population dispersal across ISEA, rather than an Austronesian migration *c*. 5500–4000 BP.

Various authors, most consistently Kayser, Stoneking and colleagues (Delfin *et al.* 2012; Kayser *et al*. 2006), have argued that another major Southeast Asian mtDNA lineage, haplogroup B4a1a (which amounts to another 15 % or so of Island Southeast Asian mtDNAs and almost reaches fixation in the Remote Pacific) is a marker for the Austronesian expansion. This is one of the cornerstones of the 'slow-boat' model since they argue that this mtDNA clade has a recent origin in Asia and dispersed eastwards with the Austronesian expansion, whereas Y-chromosome lineages in the Remote Pacific mostly have an origin in New Guinea. However, this interpretation of the mtDNA has relied on the analysis of poorly resolved control-region sequences and a lack of any genetic dating. Recent analyses of complete mtDNA genomes from haplogroup B4a1a, which afford both much better genealogical resolution and much greater chronological precision, have shown that this lineage fits more closely with the behaviour of haplogroup E, albeit with an ultimate Asian origin and a later expansion to the east (Soares *et al.* 2011). Haplogroup B4a1 most likely originated *c*. 20000 BP on the Asian mainland, but its descendant lineage B4a1a is restricted to ISEA and points east. It dispersed across ISEA *c*. 8000 BP and was already present in the Bismarck Archipelago, northeast of New Guinea, by *c.* 7000 BP, finally dispersing into the Remote Pacific *c*. 3000 BP, the period when archaeological and linguistic evidence combines to suggest that many Pacific islands were first colonised, mostly by Austronesian speakers.

The early expansion of this lineage, similar to haplogroup E, can most plausibly be explained as a response to Early to Mid-Holocene sea-level rise rather than being associated with the dispersal from Taiwan of Austronesian-speaking agriculturalists later in the Holocene. The suggestion (based on very few data) of Tabbada *et al.* (2010) that B4a1a might have spread from Taiwan via the Philippines southwards has been overturned by the more recent analysis of B4a1a. It remains possible that several other minor mtDNAs may be markers of a much later dispersal (Hill *et al.* 2007; Tabbada *et al.* 2010), but this has yet to be tested by complete mtDNA sequencing from samples across ISEA. The situation is similar for the Y chromosome, where a small fraction of Island Southeast Asian lineages has been proposed as possible markers of a Late Holocene dispersal from Taiwan, but most are thought to have arrived much earlier, with first settlement by modern humans and subsequent Late Glacial or postglacial expansions (Delfin *et al.* 2012; Karafet *et al.* 2008, 2010; Lansing *et al.* 2011).

The Late Pleistocene and Early Holocene colonisation episodes clearly correlate with the major phases of the flooding of Sundaland (Hanebuth *et al*. 2000), when people were displaced from an area the size of the Indian sub-continent into the modern lands of ISEA. The rise in sea levels virtually doubled the length of the coastlines of Sundaland, favouring the populations adapted to coastal methods of subsistence, whereas the encroachment of rainforest over the savannahs and monsoon forests that had developed during the Late Pleistocene in the interior of Borneo, for example (Bird *et al*. 2005), would have put people under severe land pressure. The outcome would have been considerable pressure on population dispersal in the Late Pleistocene and Early Holocene (Soares *et al*. 2008). Interestingly, the distribution of the rather uniform Early Holocene Hoabinhian-style lithic technocomplex across Mainland Southeast Asia and ISEA, with flakes struck from multi-platform cores, correlates approximately with the distribution of haplogroup E lineages. The indications are, therefore, that the flooding of Sundaland in the Early Holocene was the critical context in which a foraging culture with a strong maritime orientation developed across ISEA.

Demographic Trends

The number of well-dated pre-Neolithic and Neolithic sites across the vast area of ISEA is so few that it is very difficult to use ^{14}C dates, as for example, Conolly *et al.* (2008) have done in the case of the spread of the domesticates in northwest Europe and Britain, as a robust proxy for human demographic trends through the Late Pleistocene and Holocene. What can at least be discerned from the composite radiocarbon record of the Late Pleistocene in Vietnam, Thailand, Malaysia and Indonesia is that there appears to have been a significant contraction in settlement during the increasingly arid millennia before the Last Glacial Maximum (LGM), and during the LGM itself (*c*. 28000–20000 BP), followed by expansion in the Terminal Pleistocene (Rabett 2012). Many locations were abandoned in the LGM, with only a few sites, like the Tham Lod rock shelter in the highlands of central Thailand (Marwick 2008) and the Niah Caves in coastal Borneo (Barker *et al.* 2007; Harrisson 1958), places with access to a good water supply and a mosaic of foraging habitats, remaining as foci of human occupation. The LGM contraction was then followed by a rapid expansion of settlement during the Terminal Pleistocene and beginning of the Holocene (*c*. 20000–10000 BP).

The pattern of human occupation of ISEA established at the time of Early Holocene flooding remained much the same through the Mid-Holocene, but it is very difficult to gauge the extent to which its intensity may have changed significantly (as predicted by the Austronesian hypothesis) given the paucity of sites: in the whole of ISEA beyond Taiwan there are fewer than 50 sites with Neolithic assemblages likely to belong to the period 4000–2000 BP, and many of these are in the northern part of the Philippines, in the well-studied Cagayan Valley (Spriggs 2011). A further difficulty is that the archaeological record of ISEA continues to be dominated by caves and rock shelters, when we assume that most prehistoric people spent most of their lives in the open (much of the Neolithic record of cave use relates to burials). Spriggs identifies fewer than 20 open sites with Neolithic material for the period before 3000 BP in ISEA, compared with over 120 open settlement sites with Lapita assemblages in Remote Oceania to the east. The dates of the latter cluster tightly in the period 3100–2900 BP, and although there are occasional indications of pre-Lapita settlement in the western part of their distribution (Torrence and Swadling 2008), the consensus is that most sites probably represent the colonisation of Remote Oceania by Austronesian-speaking people from ISEA (with likely origins in the adjacent parts of Melanesia according to the genetic evidence discussed earlier). There is no evidence in ISEA comparable to the Lapita phenomenon in Remote Oceania for a sudden transformation in settlement densities or distributions around the time of a presumed Austronesian migration, but as Spriggs (2011, p. 517) comments in his review of 'where are we now?' with the Austronesian hypothesis, 'the universe of sites that are being compared to Lapita in order to document patterns of Neolithic spread in ISEA is not at all equivalent'.

The human skeletal record is an important source of information about population continuities and discontinuities in ISEA through the Late Pleistocene and Holocene. By far, the largest and best-studied data source is the collection of several hundred skeletons and parts of skeletons excavated by Tom and Barbara Harrisson in the Niah Caves, especially the West Mouth of Niah Great Cave (B. Harrisson 1967; T. Harrisson 1958; Fig. 2). The chronology of the burials has been much debated, in part because of problematic radiocarbon dates of the skeletal remains themselves, but a new study of the Harrisson burial records, augmented by new ^{14}C dates on carefully selected materials in demonstrable close association with the bodies (coffin wood, for

Fig. 2 The West Mouth of Niah Great Cave, looking west. The archaeological zone where the Harrisson excavations took place was in northwest corner, to the *right* of the image. (Photograph: Graeme Barker)

example), has demonstrated that burial in the West Mouth was practised in two major periods: in the Early Holocene, between *c.* 11000 and 8000 BP (referred to here as 'Mesolithic'); and in the Mid-Holocene, between *c*. 4000/3500 and 2200 BP (referred to here as 'Neolithic') (Barker *et al.* 2011a; Lloyd-Smith 2008). The use of the West Mouth for burial also continued later, to recent centuries, though other entrances to the Niah Caves complex were preferred for these 'Metal Age' burials (Cole 2012).

The pottery associated with the Neolithic burials at Niah has various styles and motifs which are peculiar to the place, such as paddle-decorated vessels, in contrast with the red-slipped pottery common at many Neolithic sites in ISEA, but the overall assemblage of ceramics, stone and shell implements and other materials (basketry for example) fits within the package of material culture identified as belonging to the 'Austronesian Neolithic' (Bellwood 1997) and several sherds have impressions within them of rice grains (discussed later), more or less contemporary with the rice grains at Gua Sireh. Hence, it has generally been accepted that the Niah Neolithic burials belong to incoming Austronesian farmers, probably from the Philippines given the adjacency of the southern part (Palawan) to Borneo though ultimately from Taiwan. However, although the Austronesian model would predict a clear discontinuity between the 'Mesolithic' and 'Neolithic' people buried at Niah, this is not in fact the case. A study of the shapes and sizes of skulls and teeth of a large sample of the West Mouth Mesolithic and Neolithic skeletal remains (using four geometric morphometric indices rather than traditional metrics) found no statistically significant differences between the two populations except for changes in dentition interpreted as related to diet (Manser 2005). The people buried at Niah, both 'Mesolithic' and 'Neolithic', were most similar in their physical characteristics to the 'southern Mongoloid' people of the region today (non-Negrito Southeast Asians, Micronesians and Polynesians), whilst also sharing some similarities with Australian and Melanesian populations. Similar continuity in physical type between Mesolithic and Neolithic populations has also been inferred from studies of skeletal remains from Gua Cha in peninsular Malaysia (Zuraina 2005).

Modes of Occupation

The genetic and archaeological evidence for an expansion of settlement across ISEA in the Terminal Pleistocene and Early Holocene coincides with signs of greater lengths of occupation of many caves, in terms of the seasons when they were visited. In the West Mouth and Lobang Hangus entrances of Niah Great Cave, a significant intensification of occupation at this time is characterised by thick deposits of ash mixed with charcoal, burnt stone and clay and pit digging, and there are indications in the subsistence data of decreased mobility (Barker 2012). Similar trends towards the more intensive use of preferred localities for settlement, and probably of decreasing mobility, in the Early Holocene can be discerned in Vietnam (Rabett *et al*. 2009; Yi *et al*. 2008), Palawan (Lewis *et al*. 2008), Java (Morwood *et al*. 2008; Sémah *et al*. 2003), Sulawesi (Simons and Bulbeck 2004) and East Timor (O'Connor and Aplin 2007).

Given the paucity of open sites and biases in the archaeological record (the use of many caves for burial, for example), there is then very little concrete information on modes of site occupation or landscape use in ISEA from the Early Holocene into the Mid-Holocene. To give three examples of well-studied cave sites: Hang Boi in northern Vietnam appears to have been used repeatedly and intensively as a wet-season camp throughout the period (Rabett *et al.* 2009); Lang Rongrien in southern Thailand was visited intermittently by people who probably moved between the coast and the hinterland on a seasonal basis (Mudar and Anderson 2007); and Ille Cave on Palawan was used through the Early and Mid-Holocene as a foraging base for hunting, collecting shellfish and gathering plant foods, probably for extended periods each year (Lewis *et al*. 2008).

A detailed programme of palynology as part of the reinvestigation of the Niah Caves has provided invaluable information on human activities within the north Bornean landscape in the Early and Mid-Holocene, that is currently unique in ISEA (Hunt and Premathilake 2011; Hunt and Rushworth 2005). With the rapid inundation of the lowest-lying parts of Sundaland by the rising sea levels of the Early Holocene, the coastal lowlands of Borneo were covered by dense swamp forest. Two pollen cores taken in the vicinity of the Niah Caves demonstrate that the isolated massif in which the main caves are situated was more or less surrounded by tidal mangrove swamp at this time (Hunt and Rushworth 2005). People still came to the caves in the opening millennia of the Holocene, between *c*. 11500 and 8000 BP, to bury their dead in the West Mouth and to use various of the entrances as camp sites (the West Mouth, Lobang Hangus and Gan Kira), but they appear not to have visited them at the time of highest sea levels, which were 3–5 m above present levels *c*. 6000 BP. However, a deep pollen core from Loagan Bunut, the largest lake in Sarawak *c*. 50–60 km inland from Niah, demonstrates a continuous pattern of anthropogenic burning and forest disturbance throughout its sequence, from the beginning of the Holocene to 6500 BP (Hunt and Premathilake 2011). The two Niah cores demonstrate a similar history of forest disturbance from about this time (as sea levels retreated to present levels and mangrove swamp gave way to more open vegetation) to the end of their sedimentary records *c*. 2500 BP or later. The Niah and Loagan Bunut palynological records indicate a broad continuity in patterns of land use by 'Mesolithic' and 'Neolithic' people on the coastal lowlands of northern Borneo through the Early and Mid-Holocene.

Cultural Practices: Burial

The Niah Caves have provided some of the best information in ISEA for continuities and discontinuities in burial practice because of recent Master's and Ph.D. studies by Lloyd-Smith (2005, 2008) and Cole (2007, 2012). There is clear evidence for continuity in burial practice on either side of the 'Mid-Holocene gap' when the caves were invested by the sea (Barker *et al*. 2011a). Most of the Mesolithic burials were 'flexed' inhumations, the bodies laid on their side or back in grave pits and their knees bent or drawn up more tightly towards the chest (Fig. 3). Other burials consisted of secondary placements of bones from a body originally buried, exposed or burnt, elsewhere. Flexed burial was initially the dominant rite in the Neolithic period, too, the bodies being laid out in rows in wooden coffins or shrouds. After *c*. 3000 BP secondary burial of unburnt bones replaced flexed inhumation as the

Fig. 3 *Left*, Early Holocene ('Mesolithic') flexed burial no. B77 and *right* Mid-Holocene ('Neolithic') flexed burial no. B205, in the West Mouth of Niah Great Cave. Both were excavated by Tom and Barbara Harrisson in the 1960s and B205 was re-excavated in 2002, when a polished stone adze was found beside the body (visible by the 10-cm scale). (Burial B77: photograph reproduced with permission of Sarawak Museum; burial B205: photograph by Graeme Barker)

dominant rite, followed a few centuries later by cremations in clay jars or bamboo caskets and, after *c*. 2400 BP, by a return to unburnt secondary burial and to the primary inhumation of extended bodies, as in the Mesolithic and at the start of the Neolithic sequence. Gua Cha in peninsular Malaysia has similar evidence for continuities in burial practice through the Early and Mid-Holocene (Zuraina 2005). The Niah graves appear to have been marked so as to be visible for later users of the cave, for example by wooden grave markers or, in the case of jar burials, by being buried with their necks visible. Other continuities in burial practice included washing the skulls in red pigment.

Although there are examples of complex secondary burial rites only found at Niah (Cole 2012), the main suite of Early Holocene/Mesolithic burials can be placed within a common burial tradition of flexed and burnt secondary burials shared by prehistoric societies in peninsular Malaysia and ISEA (Bellwood 1997). The use of fire in burial rituals was a common practice, but full cremation was generally restricted to the communities living in coastal locations (Lloyd-Smith 2008). Early Neolithic burials contemporary with those at Niah, the prime candidates for being Austronesian burials in the migration model, are in fact rare in ISEA and notable for the variability in the burial rites associated with them. A distinct common tradition (jar burial) only developed later, as at Niah; found across the Indian and Pacific regions, it was commonly associated with the appearance of metal tools (Lloyd-Smith 2005).

The restudy of the Niah Caves burials by Lloyd-Smith (2005, 2008) and associated ceramics by Cole (2012) and studies of the stable isotope signatures of some of the West Mouth skeletons (Krigbaum 2005; Valentine *et al*. 2008), have brought out subtle continuities and discontinuities in funerary practice at the local scale that have been hitherto invisible in pan-regional overviews of prehistoric burial in ISEA. The inhumations in the West Mouth and Lobang Jeragan entrances, for example, display distinct arm positions that appear to indicate particular age and gender classes, but the way these signifiers were used varied between the two caves, which are just a few hundred metres apart, implying subtle differences in social practice amongst neighbouring communities (Barker *et al*. 2011a; Lloyd-Smith 2008). Colouring bones red was more common at Lobang Jeragan, as was burying people with shell ornaments, and an unusual burial practice at Lobang Batu Parang was the placing of skulls on leg bones

(Cole 2012). Differences in the strontium and lead isotopes of the West Mouth burials (Valentine *et al*. 2008) indicate that the population buried there derived from three distinct groups of people coming from places with contrasting groundwaters, two of them identified from their geological signatures as likely to be in coastal northern Borneo, the third (mostly females) from further inland, implying that post-marital patrilocal residency was a feature of these Neolithic societies. The evidence suggests that the caves were used as places of burial by geographically separate but socially related communities who had a shared history of funerary practices and norms of funerary behaviour focused on the veneration of immediate and recent ancestors.

Cultural Practices: Subsistence Strategies

The new fieldwork at the Niah Cave and new studies of the materials from the original 1950s and 1960s excavations have yielded a rich suite of evidence for subsistence practices in the Late Pleistocene and Early/Mid-Holocene (Barker 2012). Parenchyma or plant tissues and starch grains found in sediments and on stone tools demonstrate that the people who camped in the West Mouth *c*. 50,000 years ago were already adept at collecting a wide range of roots, tubers, palms, fruits and nuts, mostly rainforest types (Barker *et al.* 2007; Barton 2005). At this time the climate of northern Borneo was cooler, drier and more seasonal than today, and savannah and open vegetation developed on the southern side of Borneo (Bird *et al.* 2005; Wurster *et al.* 2010), but the landscape around the Niah Caves consisted of a mosaic of scrub, open woodland, lowland dipterocarp rainforest, rivers and mangrove swamps (Hunt *et al.* 2007, 2012). Many of the plants collected were toxic, and techniques were evolved for leaching out their toxins by burying the plants in ash-filled pits. These foragers also hunted a wide range of game including difficult-to-catch arboreal species such as orang-utan, whilst concentrating on hunting the bearded pig, possibly by trapping or snaring them. They collected molluscs from nearby rivers and swamps, and caught large species of freshwater and estuarine fish and turtles, also probably with traps. Episodically high incidences of *Justicia* pollen suggest that they also practised burning forest edges and clearings (Hunt *et al*. 2012), presumably to increase the amount of disturbed land favourable to tubers and other plants, which they wanted to collect themselves and which would also have been attractive to pigs. Similar evidence for burning the forest and harvesting plant foods by Late Pleistocene foragers has been found at Kosipe in New Guinea, dating to *c*. 49000–44000 BP (Summerhayes *et al.* 2010). From the outset, therefore, the Late Pleistocene foragers of ISEA do not appear to have been simply opportunistic foragers.

This mode of subsistence continued at Niah without significant change to the end of the Pleistocene and into the Early Holocene, though arboreal species were targeted more regularly as the proportion of dense rainforest around the caves increased (Piper and Rabett 2009; Rabett and Piper 2012). Much as at Niah, people using Ille Cave in Palawan (southern Philippines) in the Early Holocene hunted pig, deer, macaque and a variety of small carnivores (Piper *et al*. 2011) and collected a variety of nuts, fruits and tubers including taro and yam, though intriguingly the latter was of a form identical to modern domesticated yam (Barker *et al.* 2011b; Lewis *et al.* 2008; Fig. 4). In the Loagan Bunut pollen core, amidst the evidence for systematic forest

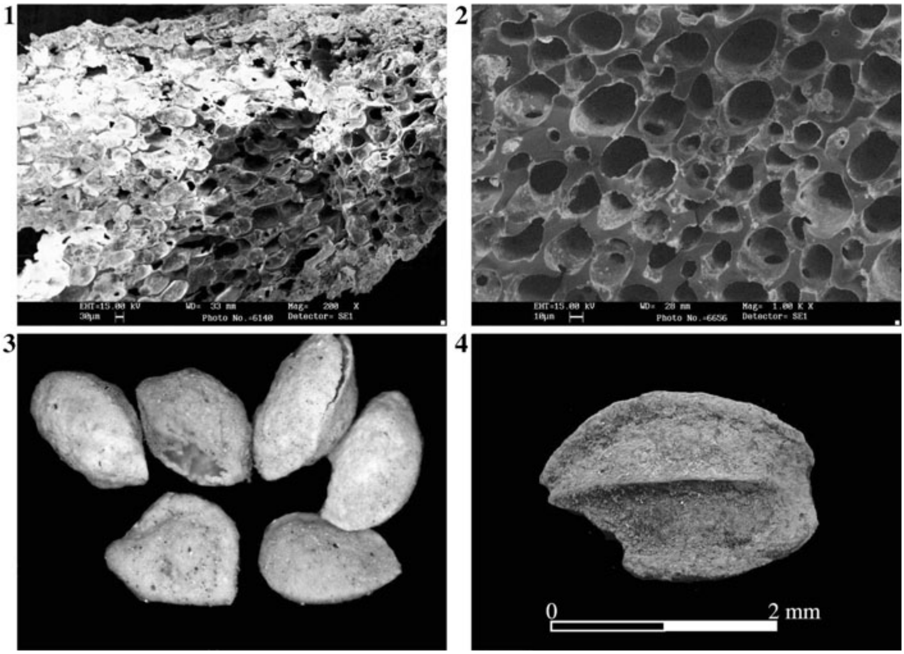

Fig. 4 Examples of Late Pleistocene/Early Holocene plant remains from Ille Cave (Palawan, Philippines): *1*, elim. *Dioscorea* sp.; *2*, elim. *Colocasia* sp.; *3*, *Boehmeria* cf. *platanifolia*; and *4*, *Canarium hirsutum*. (Identifications and photographs: Jane Carlos)

burning through the Early and Mid-Holocene, rice phytoliths identical to those of modern domesticated rice have been found in Early Holocene sediments dating to *c*.8000 BP, some 4,000 years earlier than the domestic rice grains found at Gua Sireh (Hunt and Premathilake 2011; and see later discussion). Evidence for intensive plant use in the Early and Mid-Holocene, in this case of taro, has also been found in Kuk in New Guinea (Denham and Barton 2006; Denham *et al*. 2003). These remarkable plant-management practices, with their origins in the subsistence strategies of the first modern human inhabitants of ISEA and New Guinea and which probably involved asexual propagation and the deliberate translocation of plants to improve foraging patches (further aided by burning), can best be characterised as 'vegeculture' (Barton and Denham 2011).

The isotope chemistry of the Mesolithic and Neolithic people buried in the Niah Caves indicates that the former lived in closed rainforest whereas the main group of Neolithic people lived in more open environments (Krigbaum 2005). The pollen diagrams at Niah also demonstrate more open environments during the time of the Neolithic burials than earlier in the Holocene (Hunt and Rushworth 2005). Given the long-lived evidence for forest burning, it is unlikely that these open environments can be equated in a straightforward way with cleared agricultural landscapes. In fact, the albeit limited faunal material contemporary with the Neolithic burials indicates the continuation of the kind of forest hunting practised by the Mesolithic people at Niah, though with species of more open vegetation better represented than previously. The principal animal hunted was *Sus barbatus*, the bearded pig native to Borneo (Cucchi *et al.* 2009).

People were also acquainted with domestic rice, on the evidence of fourteen grains of rice identified in seven sherds of Neolithic pottery, though notably this was out of a total sample examined of ~1,500 sherds (Doherty *et al*. 2000). Rice inclusions have been found in sherds from some of the funerary caves contemporary with the West Mouth Neolithic burials but not others. Starch grains on mortars from the West Mouth likely to be Neolithic in date are of tubers and palms such as sago. Hence, it seems likely that rice was being grown on a small scale in the Niah area at the time of the Neolithic burials, and was consumed on a small scale within a diet dominated by the products of vegeculture and foraging.

The Metal Age faunal material from the caves is dominated absolutely by wild species, but there is now evidence for domestic dogs and pigs, and occasional rice inclusions have been found in the Metal Age ceramics from the caves. The likelihood is that the people who used the Niah Caves between *c*. 2000 BP and recent centuries lived by a combination of small-scale rice cultivation and pig keeping combined with forest foraging and vegeculture augmented over the past 1,000 years by trading birds' nests with Chinese merchants, the mode of subsistence reported for the area by early European travellers. A study of the rice inclusions in the ceramics housed in Sarawak Museum from excavated archaeological sites of all periods, from Neolithic to post-medieval, and throughout Sarawak, found that high proportions of rice temper indicative of a reliable supply of husk only occurred from the tenth century AD or later, at coastal trading sites (Doherty *et al*. 2000). Current archaeological and palynological work in the interior highlands of Borneo suggests that sago, the food staple of present-day Penan foragers in Borneo (Brosius 1991), was probably the main plant food staple there for most communities until around the fifteenth century, when long-house living developed in association with wet-rice and hill (swidden) rice cultivation (Lloyd-Smith *et al*. 2010). The persistence of sago as a staple amongst well-established agricultural populations such as the Ova Melanau may be further evidence for its considerable historical time depth (Morris 1991). Interestingly, despite the single well-dated find of morphologically domestic rice at Gua Sireh *c*. 2000 BC and the indirect phytolith and pollen evidence at Loagan Bunut for people's acquaintance with rice having a deeper antiquity, the vocabulary of rice on Borneo largely derives from Malay (Blench 2011), further evidence perhaps of rice having a relatively 'shallow' antiquity as a food staple.

In this light, given its likely antiquity but long history of very small-scale use in Borneo, compared with its apparently short history as a staple food, Barton (2012) argues that rice may well have been resisted as a major food for a long period before it became the food staple that it represents today, with people continuing to rely on the starch-rich plants of the forest such as sago palm. Instead of a sudden introduction of rice to Borneo by Austronesian voyager–farmers *c*. 4,000 years ago, therefore, we may in fact be seeing a history of resistance to rice as a cultivated staple during a long and complex history of it being grafted onto existing long-lived practices of people–plant relationships that had first been established in the Pleistocene. Yet at the same time rice may well have been a prestige food, as Hayden (2003, 2011) argues. In Borneo today, growing rice is regarded as a high-risk enterprise, the crop has sacred or quasi-sacred status, and growing it and eating it are associated with status and prestige (Janowski 2003, 2007).

Can the Borneo subsistence evidence be set aside as atypical of ISEA as a whole? Domestic rice, foxtail millet, pigs and dogs are attested in Taiwan by around 5000 BP

(Bellwood 2011, p. 368), but definite occurrences of domesticates associated with Neolithic material culture further south remain tantalisingly rare, especially south of the parts of the northern Philippines adjacent to Taiwan, and there is no evidence such as in Borneo to judge the contribution of domesticates to Neolithic diet and social practice. Apart from the finds of rice grains and rice-tempered pottery at Andarayon in the Cagayan Valley of northern Luzon (3400±125 BP), at Gua Sireh in western Sarawak (3850±260 BP) and in the Neolithic pottery of the West Mouth of Niah Great Cave dated to *c*. 3500/3000 BP, the only other occurrences are possibly at Ulu Leang 1 in South Sulawesi *c*. 4000 BP (Paz 2005) and perhaps in the Marianas *c*. 3500 BP though the first directly AMS-dated rice there dates to the last 1,000 years (Hunter-Anderson *et al.* 1995). A bone of a domestic pig within a Neolithic assemblage at Nagsabaran in the Cagayan Valley of northern Luzon has been directly dated by AMS to 3940±40 BP (Piper *et al*. 2009), but genetic studies of modern pig populations and aDNA suggest that, apart from in northern Luzon, domestic pigs likely dispersed across ISEA well after the presumed Austronesian migration associated with the Neolithic material culture package (Larson *et al.* 2007). A domestic or managed pig population, probably derived from Borneo's native *Sus barbatus* or from *S. barbatus* females of this species crossed with imported *Sus scrofa* from the mainland (Larson *et al*. 2007), has been identified in the vertebrate fauna from the Gan Kira entrance of Niah Great Cave dating to the late third millennium BP (Piper *et al.* 2009, p. 693). There is as yet no reliable evidence for domestic dogs and chickens in Neolithic contexts in ISEA beyond northern Luzon, even though they were clearly part of the package of domesticates that spread across Remote Oceania at a later date (Spriggs 2011).

Discussion

Developed as a convincing mechanism for accounting for the origins of the Austronesian languages spoken by many of the present-day inhabitants of ISEA and Remote Oceania, the 'Austronesian hypothesis' has dominated work on foraging–farming transitions in ISEA for the past 25 years. It predicts the replacement or absorption of indigenous populations of foragers in ISEA by an incoming Austronesian-speaking population of rice farmers 4,000–3,000 years ago. However, a review of the four categories of data proposed by the Nanterre seminar for establishing the continuous or discontinuous nature of societal change (patterns in genetic heritage, demographic fluctuations, settlement histories and subsistence and material culture practices) indicates complex if often ambiguous continuities and discontinuities in the settlement record that are increasingly difficult to fit within the orthodox Austronesian framework of explanation (Fig. 5).

The first area of interest concerns the evidence for population continuities and discontinuities. Genetic studies demonstrate that the major population expansions in Southeast Asia were in the Late Pleistocene and Early Holocene, rather than at the time of the presumed migration of Austronesian agriculturalists. These movements were probably related to the flooding of huge areas of 'Sundaland', the landmass that linked present-day Mainland and ISEA at the time of lowered sea levels in the Late Pleistocene. In terms of demographic history, though the archaeological record for

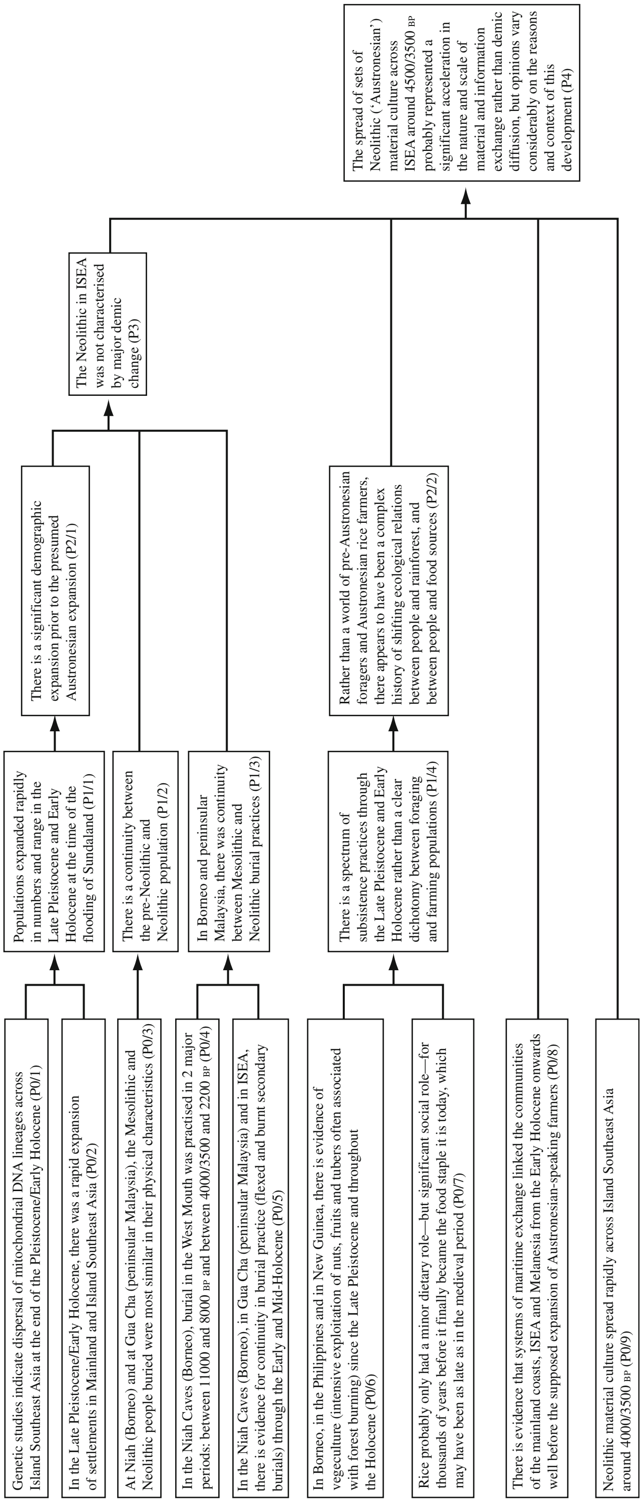

Fig. 5 Synoptic view ('logicist diagram') of the scientific argument. ISEA = Island Southeast Asia

this vast region is still exiguous compared with other regions of the world, and dominated by caves and rock shelters rather than open sites, the numbers, distributions, and occupation evidence of inhabited sites chime with the genetic evidence in suggesting that ISEA populations expanded rapidly in numbers and range in the Late Pleistocene/Early Holocene (Rabett 2012). Moreover, at the Niah Caves (Sarawak, northern Borneo), one of the most intensively studied sites (or groups of sites) with evidence for repeated human use through the Early and Mid-Holocene, the 'Mesolithic' people buried there *c*. 11000–8000 BP were of exactly the same physical type as the 'Neolithic' people buried there *c*. 4000/3500–3200 BP (Manser 2005), and despite being separated by several thousand years there are underlying continuities in their use of flexed and secondary burial. There are similar indications of continuity in the burial record of peninsular Malaysia. In terms of the long-standing hypothesis that the Neolithic was characterised by demic change, therefore, the current evidence in fact points to the most significant demographic expansions being prior to the presumed Austronesian demic expansion, and to continuity between the pre-Neolithic and Neolithic population.

Second, the evidence suggests a spectrum of subsistence practices through the Late Pleistocene and Early Holocene rather than a clear dichotomy between foraging and farming and certainly not a linear, indeed sharply defined, progress from one mode of living to another. There has long been a dearth in organic food remains from archaeological sites in ISEA, the tropical climate being not conducive to survival of such materials, but recent developments in archaeological science, particularly in field recovery techniques for carbonised plant remains and parenchyma (tissues of tuberous plants) and laboratory protocols for recovering starch grains, phytoliths and other food traces from sediments and residues attached to artefacts, are transforming the data base. Studies based on these techniques at sites such as Kosipe (Summerhayes *et al.* 2010), the Niah Caves (Barker *et al*. 2007; Barton 2005), and Ille Cave (Barker *et al.* 2011b), indicate that rainforest subsistence in the Late Pleistocene and Early Holocene frequently involved not only hunting, gathering and fishing but also 'vegeculture', the intensive exploitation of nuts, fruits and tubers, often associated with forest burning to enhance growth (Barton and Denham 2011; Denham 2011). In Borneo these practices continued as the primary subsistence activities long after people's initial engagements with rice. Phytoliths and pollens from the Loagan Bunut lake in Sarawak indicate that rice may have reached Borneo well before its currently accepted occurrence at Gua Sireh cave (3850±260 BP) and in Neolithic pottery at Niah dated to *c*. 3500/3000 BP, but whatever the date of its introduction, it probably only had a minor dietary role—but significant social role—for thousands of years before it finally became the food staple it is today, which may have been as late as in the medieval period. Plants such as sago were the preferred food staple for many communities until recent centuries (Barton 2012). Rather than a world of pre-Austronesian foragers and Austronesian rice farmers, there appears to have been a complex history of shifting ecological relations between people and rainforest, and between people and food sources. Beyond the Austronesian world, a very similar story is emerging in New Guinea (Denham 2011; Denham and Barton 2006).

There seems little doubt that domestic rice and pigs ultimately from mainland China, used in Taiwan by 5000 BP, had spread to northern Luzon in the Philippines over the next 1,000/1,500 years, along with a 'package' of Neolithic material culture including red-slipped pottery (including with dentate stamping), biconical spindle whorls, baked clay ear-rings, quadrangular adzes including of Taiwanese source materials, and other artefacts of Taiwanese origin (Hung 2005; Dobney *et al.* 2008). It is also clear that selected parts of this package of Neolithic material culture were being used across large parts of ISEA from more or less the same time as they appeared in Luzon (though the radiocarbon record is still too exiguous to enable the comparison of regional chronologies in any detail). Whether the spread of such material culture was associated to a greater or lesser extent with the spread of rice is currently entirely unclear given the tiny number of definite occurrences across most of ISEA beyond the areas nearest Taiwan (the Batanes Islands and northern Luzon). The dispersal of the domestic pig (*S. scrofa*) beyond northern Luzon was certainly post-Neolithic. Whilst the majority of Neolithic sites in ISEA lack bioarchaeological data, the subsistence data that we do have indicate a mixture of shellfish collection, forest hunting and gathering and vegeculture (Spriggs 2011).

The third key finding is the emerging evidence that systems of maritime exchange linked the communities of the mainland coasts, ISEA and Melanesia from the Early Holocene onwards (Bulbeck 2008) well before the supposed expansion of Austronesian-speaking farmers. According to its ancient DNA the warty pig *Sus celebensis* native to Sulawesi had been transported wild to the island of Flores before 7000 BP (Piper *et al*. 2009, pp. 692–693); Neolithic material culture arrived on Sulawesi some 3,000 years later without domestic pigs. Rice appears to have reached Borneo from further north, along with Indian mango, well before its assumed introduction by Austronesians, as did the sago tree *Metroxylon sago* from New Guinea to the east (Hunt and Premathilake 2011). Genetic studies suggest that bananas (Carreel *et al.* 2002), taro (Lebot *et al.* 2004), sugarcane (Grivet *et al.* 2004) and the greater yam (Malapa *et al.* 2005) were all domesticated first in New Guinea, and linguistic studies indicate that various species of trees such as sago (Kjaer *et al.* 2004) and canarium (Yen 1995) were either domesticated or translocated westwards from island to island in the pre-Austronesian period (Blench 2005). Blench (2012a) interprets the linguistic evidence as showing that vegecultural systems based on these plants had spread in an arc from Melanesia to northeast India "well prior to the spread of 'Neolithic' rice cultivation in Southeast Asia … [along] a corridor of transmission of ideas … between Melanesia and inland Southeast Asia as far as eastern Nepal". In short, from the beginning of the Holocene, as the modern topography of the region took shape following sea-level rise, people, plants, animals, material culture and information systems were entangled in pathways of movement and exchange that linked foragers and vegeculturalists in ISEA and Melanesia (New Guinea and the Bismarck Archipelago) with forager-farmers on the coasts of mainland Southeast Asia and Taiwan, and according to Blench even further westwards across the Bay of Bengal to eastern India.

The spread of sets of Neolithic ('Austronesian') material culture across ISEA around 4000/3500 BP may have represented a significant acceleration in the nature and scale of material and information exchange, the potential significance of which once 'unshackled' from Austronesian farmers is only just being discussed in the literature. Spriggs (2011, 522), for example, refers to the period as a 'macro-regional phase of conjuncture', borrowing from Vankilde's definition of phases in history when "the social climate appears 'extra hot', foreign impulses are actively and creatively incorporated, and identities rapidly and profoundly change" (Vankilde 2007, pp. 16–17). By the third millennium BC ISEA had been incorporated into a veritable 'world system' of international exchange which for example carried Southeast Asian food plants, weeds and commensal rodents westwards to India and even Africa (Fuller *et al.* 2011). Spriggs (2011) concludes that the rapid expansion and adoption of Neolithic material culture in ISEA represented above all a transformation in identities associated with new languages:

> "The real Neolithic 'package' or process of 'Neolithicisation' did not necessarily involve agriculture at all. But it certainly *did* involve pottery, its complex vessel forms and surface finish surely betokening new social relations; it certainly *did* involve a suite of shell artefacts with equally novel meanings, and also new technologies of cloth and barkcloth … One participated in this new world by speaking the new (Austronesian) language" (Spriggs 2011, p. 523, his italics).

Spriggs does not elaborate further on the mechanisms that might have carried a shared linguistic and material culture package originating amongst Austronesian-speaking farmers in Taiwan into the foraging and vegecultural world to its south, beyond characterising it as a 'new process of identity formation that seized the imagination of a mass of people on hundreds of islands across thousands of kilometres of ocean, spreading like a pulse across ISEA and into the Pacific over a few centuries' (Spriggs 2011, p. 524). He suggests that powerful new ideologies might have been the key, backed by new material symbols and practices, without speculating on what form those ideologies might have taken.

A very different interpretation of the spread of material culture is offered by Donohue and Denham (2010) who argue that its inclusion within the long-established maritime exchange systems discussed earlier, and subsequent ubiquity (especially of red-slipped pottery), "give the illusion of a standardised 'Neolithic' cultural package at archaeological sites, despite the disparate sources of many of the items implicated in this 'package'". They suggest (Donohue and Denham 2010, p. 239) in this scenario that processes of cultural change indicated by changing engagement with Neolithic material culture were likely to have been more cumulative than sudden:

> "after decades or centuries of increasing exchange and social interaction, numerous items, practices and kinds of knowledge that may have been locally restricted within or around ISEA became more common, both across space and in their co-occurrence … a Taiwanese cultural package, whether Austronesian or Neolithic, is illusory for ISEA as a whole: it did not originate in one place and disperse outward but formed through the increasing co-occurrence of used and traded items by people across ISEA, who were increasingly connected through an expanding network of exchanges".

In his recent review of the linguistic evidence for an Austronesian expansion, Blench (2012b) arrives at a similar conclusion to Spriggs about the likely role of ideology, but in a very different scenario to that of Spriggs' 'farmers without farming' hypothesis, and one that in many respects can be reconciled with the Donohue and Denham model of small-scale but cumulative cultural change within long-lived exchange systems. Critiquing the 'limited vision introduced by the Austronesian expansion hypothesis' and the tendency to turn linguistic constructs into people, cultures and archaeological horizons, he concludes that the Austronesian phenomenon in ISEA is more likely to have been an extended cultural process—'Austronesianisation' in his terms—than a single demographic event. Significantly, he demonstrates that many of the subsistence-related terms long considered clear evidence of Austronesian speakers being farmers are in fact likely to be mosaics of ancient loanwords that variously spread east from the mainland or west from Melanesia and were assimilated into Austronesian at different times. He concludes that Austronesian speakers were in fact mobile fisher-foragers rather than farmers, equipped with an innovative maritime technology, a trading ethos and, critically, a powerful religious ideology. For the character of the latter, he points to jade/nephrite earpieces (*linglingo*), *bulul*-seated figures, and seated figures with splayed legs bent at the knee, a pervasive imagery with many echoes in *adat*, the traditional religion of forest spirits practised by many ISEA people prior to the spread of the world religions. These Austronesian speakers, he suggests, assimilated pre-existing populations who practised various mixes of foraging, vegeculture and arboriculture and who spoke Austroasiatic, Papuan and unknown languages, bringing their languages into the 'Austronesian fold' by processes of language levelling. 'Far from bringing a coherent material culture package, they [the Austronesian speakers] brought almost nothing to the party, no crops or livestock. Far from bringing a specific pottery type, they would have moved different types of pottery around ISEA. Hence we would not expect the discontinuities in sites that the demographic model predicts' (Blench 2012b).

The remarkably contrasting interpretations of foraging–farming transitions in ISEA currently being proposed by Bellwood (2011, the southward spread of Austronesian farmers), Spriggs (2011, the southward spread of an 'Austronesian identity' linked to language but not necessarily to farming), Donohue and Denham (2010, the emergence of new cultural norms and practices from generations of contact within a maritime exchange sphere) and Blench (2012b, the spread of new ideologies amongst Austronesian-speaking fisher-foragers) from different readings of overlapping data sets emphasise both the richness and complexities of the archaeological record and also its comparative paucity compared with richly researched regions of similar size elsewhere in the world. An archaeological landscape of isolated and usually fragmentary data sets amidst huge empty spaces has inevitably been fertile ground for 'grand' theories relying on generally vaguely conceived processes of 'demic diffusion' or 'acculturation' to account for foraging–farming transitions usually envisaged as a linear process from one mode of living to another very different one. As the case diminishes for a single meta-narrative (whether orthodox or revisionist) to account for the Holocene archaeological record of ISEA, it is evident that—as has been accepted by most researchers for a decade or more in studies of 'Neolithicisation' in Europe—we probably need to shift the focus of enquiry away from region-wide grand narratives to the character and significance of the small-scale continuities and discontinuities in everyday practice and cultural norms of the kind that are beginning to be discerned at places such as the Niah Caves and Kuk. In such a mode of enquiry, notions of contrasting 'Mesolithic' and 'Neolithic' societies and ways of living, are increasingly unhelpful.

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