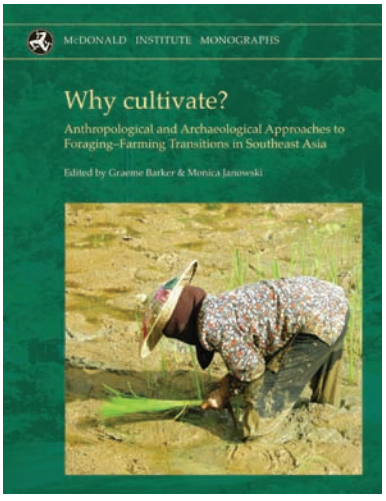
Why cultivate?
Anthropological and Archaeological Approaches to Foraging–Farming Transitions in Southeast Asia



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Chapter 1
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Chapter 1

Why Cultivate? Anthropological and Archaeological Approaches to Foraging–Farming Transitions in Southeast Asia

Graeme Barker & Monica Janowski

Archaeologists have long debated why foragers (hunter-gatherers) became farmers, arriving at very different answers in response to changing theoretical perspectives as much as to new data (Barker 2006). For the Victorians, the beginnings of farming represented the critical rung on the Ladder of Progress that lifted humankind out of a life of primeval savagery on a journey upwards to the glories of urbanism: the advantages of farming became obvious as humankind matured from a childlike state of savagery into adulthood (Westropp 1872). Writing in the mid twentieth century, and focusing mostly on the Near East (Southwest Asia) and Europe, Gordon Childe (1936; 1942; 1957) emphasized the advantages of farming over foraging: the reliable food supply provided by agriculture allowed people to settle down, and this in combination with the possibilities farming created for producing surplus food provided the springboard for global population growth and transformations in social complexity, leading within a few millennia to urbanism. He argued that climatic change at the beginning of the Holocene (the modern climatic era, the beginning of which is now dated to some 12,000 years ago) encouraged people to develop new relationships of control over plants and animals. In the 1960s and 1970s, studies of present-day hunter-gatherers, the Kalahari San in particular, led to a reappraisal of the advantages of farming over foraging, the life of pre-farming foragers being famously described by Marshall Sahlins (1968) as an Original Age of Affluence characterized by a more varied diet, less work and more leisure. The result was what Barbara Stark (1986) described as 'push' theories: that farming must have begun because foragers were forced into it, in particular by climate change and population pressure at the Pleistocene–Holocene transition. The answer to 'Why cultivate?' had become: because there was no alternative if people were to survive. By the 1980s, dissatisfaction with the under-playing of the potential role of social factors and human agency led to a greater emphasis on what Stark (1986) described as 'pull' models: foragers started to rely on particular plants and/or animals in response to climatic and environmental change and as a result were drawn, 'unsuspecting' as it were, into new relations of dependency.

In recent decades there has been increasing emphasis on the likely importance of cultural and social factors as drivers of economic intensification amongst foragers, particular in the case of complex or semi-sedentary communities. A strictly economic approach would assume that humans will always do as little as possible in order to feed themselves, and that the adoption of more productive but labour-intensive methods of obtaining food would usually be due to some kind of external pressure on the system; the latter was the basis of Esther Boserup's influential argument about successive stages of agricultural intensification in tropical environments being a response to successive population pressures (Boserup 1965). Another argument has been that, under pressure to maintain prestige amongst their followers, ambitious and competitive individuals in foraging communities might have been attracted to acquire exotic high-status foods (Hayden 1995; 2003, and Chapter 6 this volume). Shifts in ideology have also been identified as another possible 'prime mover', for example by Jacques Cauvin (2000) and Ian Hodder (1987; 1990) in the case of Southwest Asia, with late Pleistocene foragers starting to see themselves in relation to the natural world in new ways of 'culturing the wild'. From this perspective, the answer to 'Why cultivate?' became 'because foragers began to think in new ways — like farmers, so became farmers', an answer that in some respects the Victorians would have recognized.

Jared Diamond's *Guns, Germs, and Steel* (1997) represented a brilliant exposition of the then current

orthodoxy: that farming began first in a few major centres of the world some 10,000 or so years ago, and was subsequently carried to much of the rest of the world by a process of population migration. Early farmers spread out from the few hearths of domestication, he argued, taking a package of new technologies (especially pottery and new styles of stone tools) and domestic animals and/or plants, and using them to colonize new lands. In the case of Southeast Asia, Peter Bellwood in particular has linked the spread of agriculture with the spread of Austronesian languages, the dominant language family of the present-day inhabitants of the region (Bellwood 1988; 1996; 1997; 2001; 2002; 2004). Neolithic farmers with a new material culture including pottery and polished stone tools, cultivating domesticated rice and herding domesticated pigs, and speaking some kind of proto-Austronesian language, spread south from mainland China through Island Southeast Asia between about 4500 and 2000 years ago. (The 'Austronesian hypothesis' is discussed further in this volume by Barton & Denham in Chapter 2, and by Barker *et al.* in Chapter 5.)

For many decades, archaeologists, botanists and zoologists have debated how to recognize in their data the point at which the boundary between foraging and farming was crossed, suggesting, for example, that it might have occurred when people first settled down into sedentary communities; or when plants or animals began to be transferred by people from one place to another; or perhaps when genetic manipulation (such as deliberate breeding separate from the wild stock) began. However, archaeologists in different parts of the world are increasingly finding that the complexity of their regional evidence is difficult to reconcile with the concept of a simple boundary between foraging and farming, and of a straightforward transition from one to the other in a few 'hearths of domestication' followed by the spread of farmers to adjacent regions (Barker 2006). First, there is widespread evidence for people in the late Pleistocene, in every kind of environment, demonstrating subsistence practices that in one form or another presaged the later relationships to the landscape and the natural resources within it that we describe as agriculture. Second, many more societies than commonly envisaged, in all parts of the world, appear to have started to engage in different kinds of animal and/or plant husbandry soon after the transition to the Holocene, in addition to the regions regarded as the primary 'hearths of domestication'. Third, during the Holocene some forager societies combined parts of the 'agricultural package' with foraging for centuries or millennia before developing a significant commitment to agriculture, whilst others developed that commitment with remarkable rapidity, within a couple of generations. Fourth, it was not a one-way process: there is a growing number of examples, over a timescale of several centuries, of people adopting aspects of agriculture alongside foraging, then reverting back to foraging, then turning to agriculture again. Finally, there is increasing evidence for domesticates being embedded in elaborate social and ritual behaviours amongst many 'early agricultural' societies, suggesting that motivations for acquiring and using these new food resources were highly variable and rarely a simple matter of dietary stress or opportunity. In short, archaeologists are having to recognize that it is probably unhelpful to imagine – and look for – a few circumscribed places where, and times when, and reasons why, farming 'began'. Southeast Asia is typical of this emerging complexity and ambiguity, as the archaeological papers in this collection illustrate.

Anthropological perspectives

But what do we mean by terms such as 'cultivation' and 'domestication'? Ever since the Enlightenment they have come to have a 'deep' resonance in English, reified as representing the essence of 'civilized' humanity (to bring in another deep and difficult concept!) and symbolizing the watershed between a truly human way of life separate from Nature and an earlier way of life that was part of Nature and not truly human. As discussed above, the existence of such a boundary has run as a continual thread through most archaeological theorizing about the origins of agriculture, resulting in the main questions being first of locating where and when in any particular region the boundary was crossed, and then how and why. Yet the Western focus on separating humans and the rest of nature is just that, a particular notion of being in the world alien to many other societies, and its utility in thinking about past societies is increasingly being challenged. In thinking about foraging–farming transitions in the past we need to embrace the 'relational' approach to understanding the world shared by many non-industrial and pre-industrial societies described in the ethnographic record, envisaging it not as sets of separate entities such as people, plants, and animals (and discrete species within these groups in the Linnaean sense) but of relationships in which 'species' are defined in relation to each other (Ingold 2006; 2008). Such a perspective is not entirely foreign to Western thought, but historically (and at least by implication when not explicit) has been regarded as only relevant to species other than humans, the latter having distanced themselves from the relational field of nature, acting on it rather than being part of

it. It is arguable that the long-held notion of a clear boundary between a 'foraging' and a 'farming' way of life has its roots in the emphasis of Enlightenment thought on establishing that the move away from the relational field of nature did take place in the creation of a modern humanity, with 'foragers' being part of a relational field but 'farmers' having crossed a significant Rubicon (as Janowski & Langub describe it in Chapter 9 in this volume).

From a relational standpoint, humans in both 'foraging' and 'farming' activities are part of a vast web of inter-relations where they act upon other parts of the web but are also acted upon. For example, one of the major themes emerging from the archaeological studies in Chapters 2 and 5 is the likelihood of humans in Island Southeast Asia having long-lived dependencies on sago and other vegetatively-propagated plants before rice became the dominant food it is for most societies there today. Related to this theme is the likely complex cultural as much as dietary role of rice in the past given the social and cosmological ramifications related to its use today for many societies in the region (see this volume, Hayden, Chapter 6; Janowski & Langub, Chapter 9; and below). People relying on sago would have had to orientate themselves around where sago commonly grew, like the Penan of Borneo today, whereas engaging in the cultivation of rice involves different dependencies and rhythms of life (Chapter 9). In this light, understanding people's decision-making about 'foraging' and 'farming' in the past will need to embrace new notions of relative equality (though with people being more active agents than other species): the ways in which different plants and animals act upon humans are as important as the ways in which humans act upon plants and animals. Such notions of relativity are often found in indigenous perspectives on being in the world, such as the Penan's notion of *molong* (Chapter 9) or the 'perspectivism' discussed by Dario Novellino in Chapter 8.

Foraging and farming in Southeast Asia today: an entangled landscape

Today rice dominates the economic, cultural, social and often religious lives of almost every inhabitant of Southeast Asia, urban and rural. Success in rice-growing is widely associated with status and prestige and a good relationship with the spirits (Freeman 1979; Hanks 1972; Howe 1991; Janowski 2003; Novellino 2001; Visser 1989; Walker 1994). Nowadays, the two most common methods of producing rice are through 'wet-rice cultivation', often described as *sawah* cultivation, in which seedlings are transplanted into water-covered paddy fields irrigated by surface waterflow in valley bottoms (Fig. 1.1); and 'dry-rice cultivation', which involves 'swiddening' or clearing vegetation from hillslopes by a mixture of tree-felling and burning, and then dibbling the individual grains into the surface ash and soil (Fig. 1.2). The swidden fields are abandoned for rice cultivation after one or two years before the surface nutrients are exhausted and crop yields fall, and new fields are cut from the forest.

Rice is not the only crop cultivated in the region, however, and indeed it is not even the only important source of starch. Rice is a risky crop, and can easily fail. Rice-growers in Southeast Asia who depend on swidden cultivation usually also rely on many other starch foods, both those grown together with rice in their swiddens and foods from the wild, or which are managed in the wild or in ex-swiddens (Figs. 1.3 & 1.4). A number of other grains including Job's tears, millet, sorghum and maize, and root crops including taro, yams, cassava, sweet potatoes and 'Irish' potatoes, are grown in the region, and sago palms are exploited, managed and planted. It is common for people to rely on a mixture of rice and other sources of starch. The Kenyah of the Baram River in Borneo, for example, grow rice rather than a reliable crop like cassava, but fall back on wild sago or grow taro if they do not manage to grow enough rice. The Kayan also grow rice, but also grow cassava as a fall-back crop. The people of the island of Roti rely heavily on the juice of the lontar palm, growing wild, a practice which allows them to take the risk of rice cultivation (Fox 1977).

The complementarity of wild or managed resources and other, riskier, livelihood strategies is widespread in the region. Trade in particular is often paired with the use of wild and managed resources. Thus, the Penan and Punan of Borneo engage in trade in jungle produce with their neighbours and depend on the starch of the sago palm for their regular food (Brosius 1991; 1999). Recently, under pressure from other tribes wanting to 'civilize' them and from the practical fact that the forests on which they depend are shrinking rapidly due to logging, they grow and eat rice, too, but they are reluctant and relatively unsuccessful rice-growers. When they have rice, they eat it; when they do not, they eat sago. Under similar pressure to assimilate into mainstream Malay society are the Chewong people of peninsular Malaysia, whose diet depends heavily on what they obtain by hunting and gathering but who also practice small-scale swiddening, growing cassava (*Manihot esculenta*), bananas and plantains, sweet potatoes, tobacco, and occasionally a little hill rice and maize (Howell, Chapter 7 this volume). The Nuaulu of central Seram rely on a mixture of planted and wild sago palms to support their trading activities and as a result always have a reliable

Figure 1.1. *Wet-rice fields in the Kelabit Highlands of Sarawak, Borneo. (Photograph: Monica Janowski, 2009.)*

Figure 1.2. *Dibbling rice in a hillslope swidden field in the Kelabit Highlands of Sarawak, Borneo. (Photograph: Huw Barton, 2007.)*

Figure 1.3. *Tse Aren, a Kelabit woman, harvesting ginger from an ex-swidden, for use as a vegetable side dish; Kelabit Highlands, Sarawak, Borneo. (Photograph: Monica Janowski, 2007.)*

Figure 1.4. *Gillian Balang Pelewan, a Kelabit girl, harvesting cassava leaves, for use as a vegetable side dish; Kelabit Highlands, Sarawak, Borneo. (Photograph: Monica Janowski, 2007.)*

Figure 1.5. *Henry Lagang, a Kelabit hunter, butchering small game; Kelabit Highlands, Sarawak, Borneo. (Photograph: Graeme Barker, 2007.)*

source of food to allow them to engage in risky trade (Ellen, Chapter 4 this volume). All of these instances indicate how resilient and reliable 'wild' resources can be, allowing for risky endeavours.

There is, in fact, a great deal of reliance on wild plants and animals by the rural populations of Southeast Asia, not just by 'foraging' peoples such as the Penan, Chewong and Nuaulu who rely very largely on wild resources, but also by 'agricultural' peoples. Those living outside the intensively-cultivated coastal strips and delta areas commonly rely on the forest for much of their subsistence. Among such peoples, very little meat is eaten from domestic animals except at feasts; everyday meat is from hunted animals (Fig. 1.5). Even at feasts, the animals slaughtered are wild animals that have been captured and kept, but have been little or not at all altered genetically: pigs, deer, wild cattle and jungle fowl. Gathered vegetables are important sources of food for rice meals: among the Kelabit of Sarawak, for example, side dishes eaten with rice were until recent times primarily made up of wild meat or fish and of gathered vegetables, and they are still important elements in side dishes, even in towns (Janowski 2003).

It is also notable that dryland ricefields in Southeast Asia contain a good deal of the wild in them. Many crops can be grown along with the rice in these fields, including many plants that occur naturally in the forest; a detailed study of one such system was made by Harold Conklin among the Ifugao in the Philippines (Conklin 1975). Indeed it is often difficult to say whether a particular plant is 'wild' or 'cultivated', where it has been protected, encouraged, or transplanted a short way. After rice has been cultivated for one or two years, the field is often used for many years for other non-grain crops, as it gradually melts into the forest. Even once this has happened, the regenerated forest continues to be profoundly affected by the presence of many species which have been moved there by humans.

Rather than a simple dichotomy between 'foraging' and 'farming' today, therefore, there is a continuum between the forest at the one end of the spectrum and wet-rice fields at the other end, with various practices in between, including the management of many forest plants, often interspersed with rice in dry fields. Most communities use a mixture of various practices; even those who make wet fields gather many wild plants and often hunt. People keep animals which may be genetically identical to the animals of the forest. Some people are closer to one end of the spectrum, doing less to control or manipulate plants, some are closer to the other; but there is an 'entanglement' of the use of wild and managed/planted/protected resources, rather than a clear distinction between 'cultivators' on the one hand and 'foragers' (hunter-gatherers) on the other. Those who are labelled 'foragers' invariably practice some kind of plant management; and those who are labelled 'cultivators' usually rely heavily on wild resources as well. Moreover, there are many examples of people moving in different directions along the foraging/farming spectrum, like the Chewong's increasing return to a reliance on forest foraging after their experience in recent decades with government-led initiatives to become more sedentary and grow cash crops (Howell, Chapter 7 this volume).

Throughout the rainforests of Southeast Asia, therefore, the practices of 'foraging' and 'farming' are profoundly entangled. This is one of the major themes of the anthropological case studies in this volume. The sago groves of the Nuaulu are actively manipulated, and depending on distance from the settlement and frequency of extraction, some groves are owned by households or even individuals, some by a clan, and some are accessible to the entire group (Ellen, Chapter 4 this volume). The community of Krisa in coastal Papua New Guinea forages in mature forests, manages sago groves,and practises small-scale swiddening, their most common meal consisting of sago starch, leaves of the *tulip* tree and coconut milk (Belharte, Chapter 3 this volume). The Chewong's present-day mix of hunting, gathering and small-scale swiddening was described earlier; fifty years ago they relied even more heavily on wild tubers for their starch, an example of the way people have moved forwards and backwards along the foraging–farming spectrum in living memory (Howell, Chapter 7 this volume). The Batak of Palawan in the Philippines practise a mix of foraging and farming within what Dario Novellino (Chapter 8 this volume) describes as a single 'common logic of procurement'. They do not have any word for hunter, farmer, fisherman, and so on, their language instead describing tasks on the food-seeking spectrum such as *ga'aret* (hunting for wild pigs), *magbila'* (fishing with line and hook), and *maglutitem* (getting edible foods in the forest). The Penan of Borneo combine forest hunting and gathering with sago 'stewardship' or management (*molong*) and small-scale swiddening (Janowski & Langub, Chapter 9 this volume). Their Kelabit neighbours combine wet-rice and dry-rice farming with other cultivation, forest gathering and hunting, and probably made significant use of sago in the past as well, though despite the considerable overlap in Penan and Kelabit subsistence practices, rice cultivation is seen by both groups as a significantly different and special activity.

Cultivation, status and ideology

Critical to answering questions such as 'Why cultivate?' today, with likely resonances for the past, too, is the fact that the plants of the field and the forest have complex meanings for the people of Southeast Asia, as well as providing sustenance. All of the anthropological case studies in this volume stress the socially-embedded and ideologically-redolent nature of foraging and farming practices, with rice having a particularly special place in cosmologies. Major sago production by the Nuaulu is accompanied by festivities including the performance of *kahuae* dances (Ellen, Chapter 4 this volume). Translocating long-lived plants is as much a legal and symbolic act as a subsistence activity for the New Guinean community of Krisa, because it demarcates territory (Belharte, Chapter 3 this volume). Social and cultural norms encourage food sharing and discourage individual consumption or accumulation amongst the Chewong: '"[t]o eat alone" is the gravest disruptive act any person may perform ... it is severely sanctioned by cosmologically embedded rules' (Howell, Chapter 7, p. 97). In Batak mythologies, all living things are imbued with a life force and their management through hunting, gathering, and farming needs to be constantly negotiated with the spirit world (Novellino, Chapter 8 this volume). Rice is special for the Batak in that it alone of the plants of the forest and field has human consciousness (a Batak legend attributes the origin of rice to a human sacrifice). However, the foundation myths of both honey gathering and rice planting are closely related, and tools used in both foraging and farming have symbolic powers that help mediate between people and their environment; a particular kind of dibbling stick, for example, has magical properties capable of influencing rice growth (Fig. 8.4). Rice is certainly the most important, though not the only, cultivar in Southeast Asia that is regarded as closely linked to (in effect 'kin of') humans and the human body. In a widely-told myth, rice originated from the body of female ancestor; some versions say that other key cultivars also grew from it (Wessing 1997). Such myths are an expression of the kinship believed to exist between humans and those plants that they selected from the natural environment to be cultivated.

The cyclical nature of reproduction in grains such as rice is likely to be central to the focal symbolic and cosmological role which they have in many parts of the world. In temperate zones, the life cycle of grains is closely linked to the seasons, and the whole complex is associated with a cycle of death and rebirth (Frazer 1890). In the tropics, too, the life cycle of the rice plant is associated with that of humans, although not with that of the seasons. Grains can be measured, weighed and stored. Grain plants grow from seed, undergoing a radical transformation which lends them to being imagined as miraculous, cosmologically central, crops, in contrast to vegetatively-reproduced plants that merely create more of what they themselves are. This capacity to transform into something else is arguably at the root of the fact that rice is associated with great potency and life force, closely connected to the potent world of the spirits and the ancestors. It is notable, however, that rice, unlike other grains grown as crops, also reproduces vegetatively, giving it the potential for multivocal symbolism linking different forms of reproduction.

Rice is commonly regarded in Southeast Asia as a critical and visible expression of human achievement and status (Fig. 1.6). For many groups, being able to eat rice is not a matter of survival on a nutritional level but of social survival: to eat rice is prestigious. Among many groups, it is only those of high status who eat rice all the time. Eating rice is also associated with proximity to the spirits and the ancestors, which is a mark of high status. The very whiteness of rice may well be significant here: whiteness is the colour of the spirits. In Sulawesi those of high status are said to have white blood (Cummings 2002). Rice enables large meals to be provided for others, in the process boosting the prestige of the providers. The provision of rice for others is the basis of rice-based kinship among the Kelabit, which itself is the basis of differential status and hierarchy (Janowski 2007b).

However, the hierarchically-differentiated societies associated with rice-growing do not necessarily imply a different standard of living or a separation from others, at least not among small tribal societies. Those of high status are able, because they grow a lot of rice, to feed others and buy high-status objects from outside, which become heirlooms carrying the potency of their owners. The motivation for going to all the trouble of growing rice appears to be primarily status itself. It should be noted, however, that new notions of what should be implied by high status are rapidly developing, countering the egalitarian lifestyle which has been coupled with a hierarchical ideology within small-scale societies in the region until recently. In town, there is a growing tendency towards spending the more exchangeable financial gains of modern-day status on 'consumer' goods, big houses and children's education.

In the highland interior of Sarawak, rice acts as a symbolic differentiator between two lifestyles perceived by their practitioners to be radically different: that of the rice-growing Kelabit and of the sago-managing Penan (Janowski & Langub, Chapter 9 this

Figure 1.6. *Rice feast in a Kelabit longhouse; Pa' Dalih Kelabit Highlands, Sarawak, Borneo. The lines of leaf wrappings contain rice, and in between are plates for forest and cultivated vegetables and meat. The occasion of the feast was a visit by people from a village in Kalimantan, Indonesian Borneo. (Photograph: Graeme Barker.)*

volume). This difference is expressed in the leaving of marks (*etuu*) on the landscape by the Kelabit through earth moving, megalith erection and stone carving, as well as by the making of rice fields themselves, whereas the Penan only leave traces or footprints (*uban*). The Kelabit believe that rice is special, in that it is only with human help that rice can grow at all, whereas other crops are believed to 'grow on their own'. Through their rice-growing the Kelabit generate human life (*ulun*) and construct rice-based kinship and status differentiation (Janowski 1995; 2007b). The Penan are arguably regarded as the equivalent of children by the Kelabit, unable to 'grow up' by growing rice and feeding others (Janowski 1997). On the other hand, the Kelabit are also hunter-gatherers, like the Penan, and the difference between them and the Penan is greater on an ideological than on a practical level; the transition from hunter-gatherer to rice-grower is one which is often more symbolic than real, since many rice-growing groups subsist heavily on wild or managed resources.

As the key symbolic crop for most Southeast Asian farmers, rice is saved up for feasts, eaten by those considered to be closest to the spirits and the gods, consumed at rituals and made into alcohol (rice beer and rice spirit). It is often mixed with other starch, both in meals and for snacks. The nutritional importance of other starch crops is masked by the fact that they are usually eaten either at meals as substitutes for rice (the ideal starch staple) or mixed with rice; or as snack foods. A high proportion of starch food is eaten as snack foods throughout the region, despite the valorization of the rice meal. Cassava, sweet potatoes and maize are all very important snack foods, prepared in various tasty ways. Snack foods function as social lubricators, allowing for free and easy conversation between groups of people sharing them. While rice meals are shared only within the household or at feasts, and make important symbolic and status statements, snack foods are freely shared. Rice-based snack foods are also made, but they are eaten in different contexts, associated with the rice-growing cycle, provision for others or ritual exchange of rice in contexts of common consumption. It is interesting to note that all three of these central snack foods (maize, sweet potatoes and cassava) come from the Americas and the last two, at least, are generally assumed to have been in Southeast Asia only in post-Columbian times. It may therefore be that their introduction allowed for the expansion of snack-based social gatherings in relatively recent times. It may also be, however, that the consumption of other snack foods such as bananas, taro and sugar cane may have been more developed in pre-Columbian times.

Wild resources are also important cosmologically as well on a practical level for many people in the region. While this is most studied among groups which do not have developed rice-growing, such as the Chewong studied by Howell (1984, and Chapter 7 this volume), there are indications that it also applies among rice-growing peoples. Among the Kelabit, there is a cosmological complementarity of rice and foods seen as wild (Janowski 1995). A rice meal is not a rice meal without such side dishes, which include, among many peoples of the region, wild foods. The most highly-valued side dish among non-Muslim peoples of the region is wild pig. Arguably, the wild pig can be seen as 'standing for' the wild as a whole within the rice meal, taking a complementary role to rice (Janowski 2003; 2007b).

Grains need a specially created space for them,

separate from the surrounding environment, because they need sunshine where there is tree cover around and they are easier to gather when they are concentrated in one place. Hence a crop such as rice — particularly wet rice — tends to delineate a particularly 'human' space, controlled and planted. As Barton and Denham discuss in Chapter 2 (this volume), this is much less the case with vegetatively-planted crops, which can be planted interspersed with wild-growing plants and trees.

In this respect it is very striking that the Kelabit farmers and Penan foragers of Borneo, whilst both in reality depending heavily on foraging for much of their diet, are unanimous in believing that there is a significant gulf — psychological and cosmological as much as practical — between their respective ways of life. Penan life involves living in a close spiritual association with the forest, and rejecting the implications of rice-growing. Kelabit life involves the creation of rice-based kinship and status and a clear separation between the world of humans and that of the forest through the creation of the rice fields along with the variety of symbolic structures (marks, or *etuu*) mentioned earlier. This does not mean that the Kelabit do not continue to depend on the forest, both practically and on a spiritual level, however submerged this dependance may be — or that they could not go back to complete reliance on the forest if they wished, an ever-present possibility lived out by young men on a daily basis. They constantly, every day, make the choice to construct a different way of life, based on rice. So these two societies share many similarities in their place on the spectrum between foraging and farming, both relying heavily on the wild, yet have entirely separate world-views. There is the same profound psychological difference between people within similarly overlapping forms of subsistence in tropical Australia and New Guinea:

> the Gidjingali had a deep sense of 'curation' of the country and of its spiritual essence; indeed, this was one of the mainsprings of their world view. Despite this, in an ecological sense, they saw themselves as hunters. Gardening or farming in an explicit interventionist sense was the way of life of other people (Jones & Meehan 1989, 129).

Rice, then, ushered in a different way of conceiving of the relationship between people and the rest of the natural world; and a different relationship between individual humans — less egalitarian, more hierarchical (although based on kinship: see Janowski 2007a). The potential for this in the region goes back a long way. It now seems likely that rice first entered the region much earlier than was thought until recently, but only recently, perhaps in the past few hundred years, became the dominant crop which it is nowadays (Barker *et al.* Chapter 5 this volume). Although in some parts of the region, even in remote areas such as the interior of Borneo, it may have been cultivated in small amounts thousands of years ago, and probably had an important social role, it is quite possible that it did not become as important as it is now, even on a ritual level, until recent centuries. The reasons for the historical growth in importance of rice can only be guessed at, especially in more remote areas where there are very few, and often no, data available, but certain characteristics can be hypothesized as important, both now and in the past. These include qualities which it shares with other grains: its storability, which allows for planning; its measurability, which allows for the development of its position as a crop associated with status (both in terms of advertising personal success and in terms of accumulation on the part of leaders and hierarchies, including through taxation); and its transformative quality, by contrast with roots, which arguably heightens its association with the spirit world. The whiteness of many rices strengthens this association, since whiteness/transparency is widely associated with the spirit world in the region.

Foraging and farming in the archaeological record

Given the entanglement of foraging and farming for present-day societies in Southeast Asia, it seems inherently likely that the development of plant and animal management practices in the past would have involved a similar 'entanglement' of practices which might now be labelled as 'cultivation', and practices which might be labelled 'hunting and gathering' (Janowski & Barton in press). New archaeological findings suggest that this was indeed the case (e.g. this volume, Barton & Denham Chapter 2; Barker *et al.* Chapter 5).

Today there are wild rice strains in both tropical and sub-tropical areas of Southeast Asia, Indochina and India, but the strains which were domesticated are sub-tropical and are believed to originate in northern Indochina and eastern India. Given the coastal wetland habitats of most wild rices today, it has usually been assumed for both China and Southeast Asia that the earliest forms of rice cultivation in the region would have been in seasonally-drying swampy environments, though Hayden (Chapter 6 this volume) argues that initial rice domestication in China may in fact have been by foragers in upland hill terrains where it would have been easier to clear vegetation by burning, much as Chester Gorman (1971) originally suggested for Southeast Asia. In terms of direct archaeological evidence for rice in the latter region,

though, the first evidence is currently restricted to marshy lowlands. Phytoliths (microscopic silica fragments), that on morphological grounds are likely to belong to domestic rice, have been found at the settlement of Khoh Phanom Di, situated on the marshy coastal lowlands of Thailand, from about 6000 BC (Kealhofer & Piperno 1994). The first appearance of similar phytoliths in sediments flooring the Loagan Bunut lake in Sarawak date to several thousand years before their assumed introduction to Borneo by Austronesian farmers (Barker *et al.* Chapter 5 this volume).

When rice became a staple food in these regions is an entirely different question. In coastal Thailand, it was not until after 2000 BC that the inhabitants of Khok Phanom Di appear to have started to eat rice as a food staple: after this time their pottery contains rice husks (from the use of rice straw in the clay temper), specialized shell knives were manufactured for harvesting rice, and their coprolites (desiccated faeces) contain rice husks together with fragments of the kind of beetles that live in stored foods such as rice, and mouse hair suggestive of vermin-infested rice stores (Higham & Thosarat 2004). Morphologically-domestic rice and the bones of domestic water buffalo have been found at Ban Chiang in interior Thailand dating to the mid second millennium BC, the thickened phalanges of the buffalo a possible indicator that they had been trained to pull ploughs (Higham 1995). In Sarawak, an analysis of a large sample of potsherds from a suite of (mainly coastal) Neolithic, Metal Age and Historic sites indicates that rice temper only became common in the medieval period (Doherty *et al.* 2000). In the case of both China and Southeast Asia, Hayden (2001; 2003; and Chapter 6 this volume) suggests that, whether first taken into deliberate cultivation on hillslopes or marshy basins, and even though probably eaten on only a very small scale for millennia, rice probably always had a special status for the foragers who started to use it in the early or mid Holocene, as a difficult-to-obtain and risky-to-grow luxury food, valued for consumption at prestige occasions.

It has generally been assumed that the clearance of forest for large dry fields on hillslopes for rice cultivation, as practised by present-day 'swidden' or 'shifting' cultivators in Southeast Asian tropical forests (Fig. 1.2), would have been extremely difficult or impossible without access to heavy iron tools. However, it is possible that rice could have been grown in small hillslope clearings in Southeast Asia before iron was introduced to the region (generally around the middle of the first millennium AD), using a combination of burning and stone tools for the planting and transplanting of a variety of crops, without necessitating the complete clearances of existing vegetation. Burning to enhance vegetation growth is a strategy that goes back 50,000 years in the region on the evidence of shifts in pollen spectra at Niah Cave (Barker 2005; Barker *et al.* 2007; and Chapter 5 this volume) and Hayden (Chapter 6 this volume) suggests that it may have been practised by late Pleistocene foragers in China as well.

Rather than the cultivation of seed crops such as rice, Barton and Denham (Chapter 2 this volume) argue that 'vegeculture', the vegetative reproduction of tuberous plants, is likely to have been the earliest form of deliberate plant tending in the tropical rainforests of Southeast Asia. Primary evidence for this is the remarkable botanical material, starch grains and fragments of parenchyma or plant tissue, recovered from the recent excavations in the Niah Cave dating to 50,000 years ago, associated with the burning evidence mentioned above. There is similar evidence from Ille Cave in Palawan of late Pleistocene/early Holocene age (Barker *et al.* Chapter 5 this volume) and elsewhere in Southeast Asia (Denham & Barton 2006; Pavlides & Gosden 1994; Paz 2005; Summerhayes *et al.* 2010). Multiple domestication events in different parts of Island Southeast Asia and New Guinea appear likely in the case of banana, sugar cane, taro and yam, probably by the early Holocene (Carreel *et al.* 2002; Grivet *et al*. 2004; Lebot *et al*. 2004; Malapa *et al.* 2005; and Barton & Denham Chapter 2 this volume).

It is very probable that grains other than rice were grown in larger quantities before rice took over as the dominant crop, though little is known about the antiquity and history of their cultivation. Another view is that tree crops were brought into the human fold very early in terms of being tended, protected, and perhaps even transplanted (Belharte Chapter 3 this volume) within what Les Groube (1989, 300) described as a 'strategy of minimal manipulation to enhance the growth of existing forest food plants such as bananas, swamp taro, *Pandanus,* and sago'. Genetic modifications to the *Canarium* tree, an important source of nuts, are thought to have been caused by Pleistocene foragers recognizing the advantages of nurturing useful plants where they grew naturally, or grouping them in useful locations and preparing the ground for them (Cosgrove 1996; Smith 1995). Bellwood (2004) accepted that management of tree crops did take place before the Austronesians arrived, but argued that it was only once the Austronesians brought the 'idea' of cultivation to the region that they were domesticated and grown as crops. Nevertheless, whatever their relative antiquity, it appears increasingly likely that the intensive exploitation and manipulation of seed plants, tubers and tree crops, and their translocation to beyond their natural ranges, were all being practised in the early and mid Holocene,

and perhaps in the late Pleistocene, thousands of years before the supposed first introduction of farming to Southeast Asia by Austronesian farmer-voyagers 4000–5000 years ago. Southeast Asia then, as now, was an 'entangled landscape' of foraging and farming (Janowski & Barton in press).

Trajectories of change

In Chapter 3 (this volume) Stefanie Belharte suggests from the perspective of historical ecology that human foraging strategies in tropical rainforest have always targeted secondary vegetation and woody perennials, and that the distinction between plain harvesting or gathering and direct management is likely to have been blurred (the 'entangled' landscape of the tropical foraging/farming spectrum). She suggests that early human colonists of rainforest may have started by exploiting secondary vegetation in natural forest gaps and in their own incidental clearings, but over time would have deliberately favoured these environments by removing vegetation and so on. The evidence from the Niah Caves for a long-lived 'vegeculture' of sago and starchy tubers associated with the burning of forest from *c.* 50,000 years ago (Barker *et al.* 2007) and of a similar exploitation of taro, yam and *Canarium* at Ille Cave from *c.* 11,000 years ago (Barker *et al.* Chapter 5 this volume) fits this model extremely well.

Stefanie Belharte argues for a likely succession in her study area in New Guinea: from 'sago management' (thinning, clearing, and weeding, like the *molong* or stewardship of the present-day Penan in Borneo, with artificial propagation a natural development); to 'agroforestry' ('trees and palms ... managed by a range of practices spanning the divide between "foraging" and "farming"': p. 30) involving the opening of the forest canopy; to 'swiddening', in which human clearing activities purposively mimicked natural processes, and crop assemblages included both managed woody perennials and non-woody comparatively short-lived and annual plants. She distinguishes between 'vegeculture', the management of woody perennials through for example their propagation through tubers, suckers, and cuttings, from 'vegecrop', the use of the vegetative parts of these plants (tubers, stems, leaves, and sterile fruit). Importantly, she argues that sago management, agroforestry and swiddening form 'a succession less of events than of conditions enabling cumulative developments' (p. 35), using the analogy of adaptive radiation in an evolutionary trajectory. Thus the increasing management of perennial species would tend to lead to the development of agroforestry, the increasing substitution of regrowth with short-lived species would tend to lead to swiddening. Interestingly, the community of Krisa that she studies have a local legend of dietary history from an initial period when people ate wild yams, a second stage with bananas, a third stage with sago (said to have been introduced in the eighteenth century), and a fourth stage with sweet potato (introduced in the colonial era), implying (on her ecological model) a subsistence trajectory from the use of regrowth vegetation to a parallel development of intensifying management of woody perennials and of successively shorter-lived and intensively managed swiddens.

One approach to understanding trajectories of change in Southeast Asia, whether involving the adoption of systems of more intensive control over the natural environment (including 'cultivation'), or resisting certain strategies, is the economic argument put forward by Boserup (1965). Clearly, higher returns for labour are an important factor in the decision to choose one crop, or one livelihood strategy, over another. It is conceivable that the increased development of environmental manipulation in the late Pleistocene and early Holocene, accompanied by the greater reliance on perennially-yielding starch sources such as taro, yams and banana, reflected in part foragers' responses to the rapid growth of dense lowland rainforest after the Last Glacial Maximum 20,000 years ago. However, given the importance of the social and cosmological roles of plants, particularly rice, in Southeast Asia, other factors are also likely to have been important in trajectories of change.

The transition to rice-growing is not an easy one in the present day. The success of sago as a reliable and productive staple and trade crop in the Moluccas over at least the past 1500 years leads Ellen (Chapter 4 this volume) to comment that 'it is utterly pragmatic for people to question why they should cultivate at all' (p. 57). Among the Kelabit, rice-growing is described as *lema'ud*, hard work, and is seen as burdensome and tiring, whereas hunting and gathering are regarded as enjoyable (Janowski & Langub Chapter 9 this volume). Children and young people hunt and gather much more than adults. Growing up and taking up rice-growing are considered to be a difficult transition, particularly for young men strongly associated with the forest and the forest-based way of life. The possibility of a lifestyle based on forest products (both managed and not) is always present before Kelabit eyes, in the form of the lives of their neighbours the Penan. The fact that the Penan refuse the transition to becoming rice farmers is, in Kelabit eyes, a refusal to grow up (Janowski 1997). It is also a refusal to enter into the generation of differential status, which cannot be achieved except through rice-growing and the feasting and purchase of prestige goods which also

derive from rice-growing (Janowski 2007b), though the Kelabit can well understand the attractiveness of a lifestyle which does not involve rice-growing and is forest-based. Their reactions underline the complexity and entanglement of the 'transition' from foraging to farming, and the centrality of the growing of rice rather than other crops in differentiating between different people's world-views in the region.

The Chewong are in many ways more similar to the Penan than to the Kelabit (Howell Chapter 7 this volume). They grow a little rice but they rely mainly on root crops. Like the Penan, they are reluctant to enter into a lifestyle which is sedentary and based on rice cultivation, preferring to remain reliant on wild and less intensively-managed resources, and on vegeculture, in particular the planting of yams. The Chewong are, then, 'farmers', according to traditional definitions of plant cultivators, but when one considers their beliefs about their relationship with the cosmos it becomes more difficult to assign them to such a category. Much of their reaction to the opportunities and pressures to change they have been experiencing in recent decades appears to relate more to the continuation of the traditional social and cosmic order than to short-term individual maximization of advantages, although there are signs of increasing inequalities. Their forest economy is subject to social and cultural norms which encourage sharing and discourage individual accumulation or consumption, and which resist serious engagement with settled agriculture and its reliance on seasonal crops. They acquiesce to the demands of commercial pressures yet also resist them.

It would seem that in rejecting a transition to a rice-based lifestyle, the Penan and the Chewong — and some Kelabit young men — are rejecting the hierarchy that is embedded in rice-growing in most societies of the area. As far as Kelabit young men are concerned, they are eventually drawn into rice-growing by women, and forced to engage in the status quest. Penan and Chewong are also being drawn in, through pressure to grow rice. Indeed, it seems that many rice-growing groups in Borneo originate from groups which did not grow rice and were more egalitarian. With rice-growing, they gradually adopt social differentiation (Sellato & Morgan 1994). The Chewong's cultural values of hunting, gathering and sharing produce their deeply held egalitarian ideology, and their ethos of immediate consumption and immediate spending of all surplus, have thus far been sufficiently strong to prevent the development of sustained settled farming.

In the light of such evidence, Barton and Denham (Chapter 2 this volume) conclude that, given the antiquity and efficacy of vegeculture in Southeast Asia, it is easy to imagine how rice could have been actively resisted by the prehistoric population of the region as they began to encounter it through the mid Holocene. Even though, as Hayden argues in Chapter 6 (this volume), it could have been a relatively small step to introduce wild rice seeds into the burned areas like clearing edges being used for tuber vegeculture, for forest-based foragers and vegeculturalists like those of the Niah Caves and Ille Cave, engaging in rice cultivation could well have represented 'the Other', a profound psychological separation from the forest, as it does for the Penan today. They suggest that rice cultivation was probably only gradually grafted onto vegeculture, rather than swiftly supplanting it. Certainly according to the subsistence data at the Niah Caves it appears that rice played a very small role in people's diet for a long time after its introduction (whether the latter was *c.* 6000 BC, as the Loagan Bunut phytoliths imply, or nearer 2000 BC, the age of the rice remains at Gua Sireh and Niah: Barker *et al.* Chapter 5 this volume): the palynological record suggests that rice cultivation only became dominant in inland Borneo in the last 1500 years (Anshari *et al*. 2001) and the frequency of rice temper in pottery from numerous archaeological sites in Sarawak, if it is a proxy for the intensity of rice cultivation, implies that rice may not have been the major staple food until recent centuries (Doherty *et al*. 2000). Nevertheless, it seems likely that, however small scale its dietary role, rice had an important social role from the time of its first introduction, the small quantities of rice found at sites such as Niah, Gua Sireh and Andarayan (in the Philippines) as much about cultivating social relationships as about cultivating plants.

In this we concur with Hayden's argument (Hayden 2001; 2003; and Chapter 6 this volume) that rice was probably from the beginning a special or luxury food associated with status, and that this was, in fact, the impetus behind its adoption. He argues that rice would not have presented as an attractive crop, since it is a risky crop with potentially low returns (particularly without metal tools or buffaloes), whether cultivated as a wet crop or on dry land. It does not present as an obvious candidate for domestication, since in the wild it tends to reproduce vegetatively rather than by seed, and the labour costs of gathering the easily-shattering seed are very high. He concludes, therefore, that the palatability of rice led to its gathering and eventual domestication in the context of feasting occasions amongst forager communities, as a way of projecting status. He suggests that originally the most important way in which rice was consumed was perhaps as alcohol. Nowadays, rice beer and rice

spirit are widely associated with large-scale social gatherings, ritual meals and offerings to the ancestors, underlining the central symbolic role of alcohol derived from rice.

Conclusion

In this chapter we have tried to set the scene for the ensuing papers presenting anthropological and archaeological approaches to investigating land-use systems in Southeast Asia, present and past, in particular by discussing the insights that the different disciplines can draw from each another. The background to the original seminar that brought the authors in this collection together was the long-running debate about 'the transition' (the orthodox view of a primary one-way transition) from foraging to farming in the region. For two decades this has been dominated by the 'Express Train' model of a southwards expansion of Austronesian rice farmers 3000–4000 years ago and their displacement of indigenous foragers, though as the archaeological papers in this collection describe, this theory is increasingly coming to seem far too simplistic.

What can we learn from present-day foraging and farming societies in Southeast Asia today relevant to past foraging/farming transitions? The first major implication from the ethnographic case studies is that, though it is usually assumed in the archaeological literature for the region that there is today, and would have been in the past, a clear dichotomy between 'foragers' or 'hunter-gatherers' and 'cultivators', there is in fact a continuum between the forest at the one end of the spectrum and wet rice fields at the other end, with various management practices in between. Most 'foragers' practise some kind of plant management, most 'cultivators' rely heavily on wild resources as well. There are many examples in the ethnographic literature of people deciding to shift their position in different directions along that spectrum. All communities manage and manipulate the natural environment in some way, and 'cultivation' including 'rice-growing' is only a more intensive version of something which is fundamental to human nature. The primary implication of the archaeological case studies is that there is increasing evidence for much the same complexity or 'entanglement' of behaviours in prehistory. A wide variety of seed plants (including rice), tubers and tree crops was being managed and manipulated thousands of years before the supposed arrival of Austronesian rice farmers. Rice may have been present from 6000 BC, though it probably wasn't an important dietary staple until the past 500 years, posing questions about why it appears to have been resisted by many societies for long periods, at least as a staple food.

Figure 1.7. *Muned Aren and other Kelabit women harvesting rice in the Kelabit Highlands of Sarawak, Borneo. (Photograph: Monica Janowski, 1987.)*

In this context, one of the major themes emerging from the ethnographic case studies is that the wild plants and crops used by present-day foraging and farming communities in Southeast Asia are associated with specific norms of social interaction and complex ideologies. Rice especially has a sacred or quasi-sacred status for many societies as well as being the source of considerable prestige. Unlike the cultivation of vegetatively-planted forest crops such as tubers, rice cultivation entails a marked separation of field from forest (Fig. 1.7), necessitating a world-view distinctly different from that of the forest-dwellers — a fact acknowledged equally by the Penan foragers and Kelabit rice farmers of Borneo, though less by planners and government authorities intent on persuading forest peoples such as the Penan and Chewong to settle down and become rice farmers. The Penan/Kelabit and Chewong examples imply that rice cultivation could well have been actively resisted by prehistoric vege-

culturalists precisely because it represented a distinct psychological separation from the forest. Contrasting relationships between rice cultivation and the exploitation of 'the wild' are apparent in Novellino's study of the Batak (Chapter 8 this volume): he suggests that the Batak regard all animals and plants as subject to various degrees of management within a 'common logic of procurement', and success in both rice planting and honey gathering is attributed by them to their successful negotiations with the spirit world. There is no common relationship of people to plants and animals in Southeast Asia today, nor should we expect uniformity in past foraging/farming transitions, including in the ways in which foragers first started to 'manage' forest foods, to create swiddens or to engage in the cultivation of rice.

The question posed by this book is probably unanswerable in its simple form, since it is difficult to identify a clear transition to something called 'cultivation' in Southeast Asian land-use systems — and the principal finding from both the archaeological and anthropological case studies is probably that we should not expect such a clear transition ever to have existed. The chapters in this book discuss more restricted and closely-defined trajectories of different kinds, past as well as present: towards greater control of the environment (though that is not so easy to define); towards the growing of certain crops; or resistance to such trajectories. They try to understand some of the fundamental motivations involved in these trajectories, unpacking the notion of 'cultivation' and looking in more detail instead at specific trajectories, relating to specific situations and specific plants.

Both archaeological and anthropological insights in recent years suggest that transitions (past or present) between 'foraging' and 'farming' (and between 'farming' and 'foraging') are not only complex and 'entangled', but should also be seen as having profound social, cultural, religious and cosmological significance. The significance of controlling the natural environment seems to go deep in the human psyche, and this is expressed both in scholars' long-running interest in increasing control ('farming') and in local people's attitudes to taking up new crops — in Southeast Asia, rice — which are symbolic of high levels of control over the natural world. This implies that rather than asking 'Why cultivate?', as the papers in this volume demonstrate, we need to ask: 'Why cultivate this or that crop?' 'Why combine the management of this resource and the planting of that plant?' 'Why manage this resource and not that?' 'Why *not* cultivate rice?' and, perhaps above all, 'What are the social, cultural, symbolic, religious and cosmological implications of decisions around the management of natural resources?' We are some way from having the methodologies to address such questions with precision, but at least it is clear that the future research agendas of both anthropologists and archaeologists will need to address this complexity if we are to move beyond the current simplistic models of tropical 'foragers' and 'farmers' and the continuing focus on how the 'former' became the 'latter'.

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