

Past Human Migrations in East Asia

Matching archaeology, linguistics
and genetics

Edited by
**Alicia Sanchez-Mazas, Roger Blench,
Malcolm D. Ross, Ilia Peiros and
Marie Lin**

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1 Austronesian cultural origins

Out of Taiwan, via the Batanes Islands, and onwards to Western Polynesia

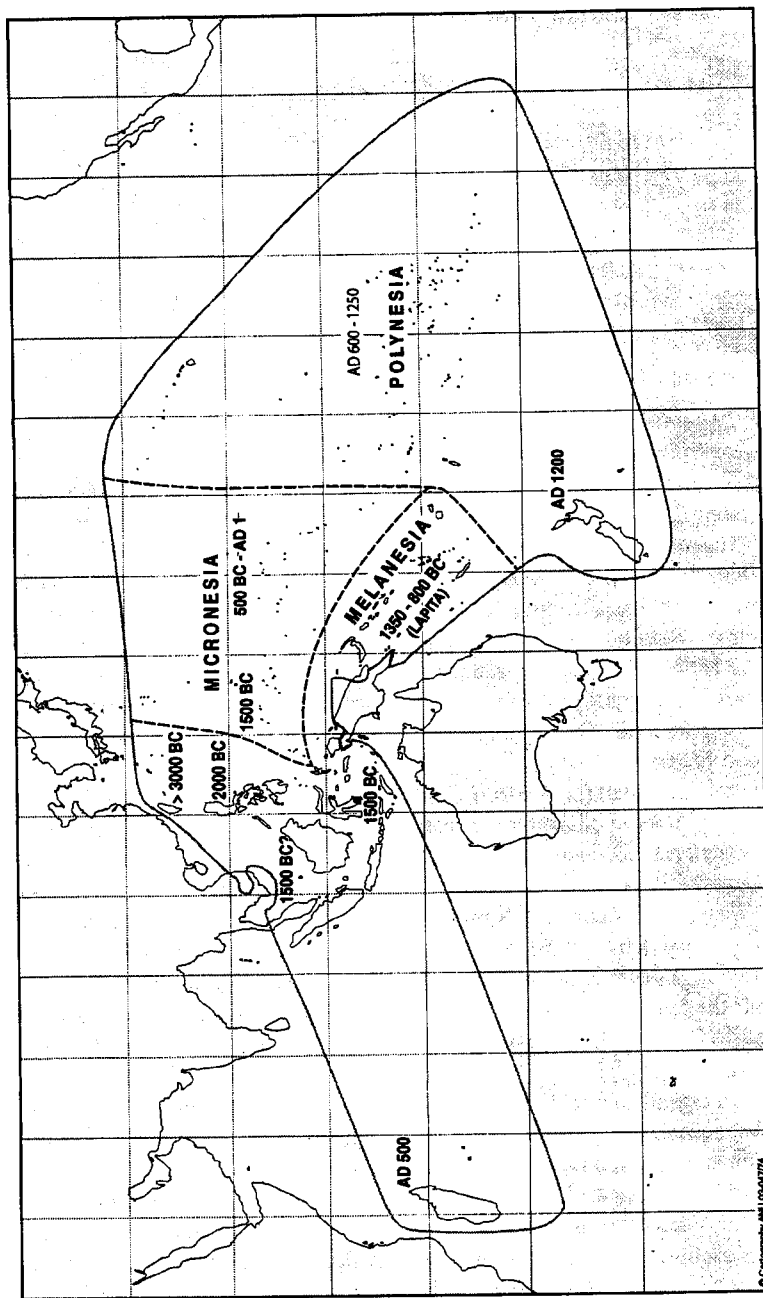
Peter Bellwood and Eusebio Dizon

The 'Express Train' and 'Out of Taiwan' models for Austronesian origins

In 1988, Jared Diamond wrote a much-quoted article in which he compared the Austronesian dispersal from South-east Asia into Oceania to the rapid movement of an express train (Diamond 1988). This view was based on archaeological evidence, and Diamond did not specify a particular homeland for the Austronesians. He noted that any suggestion of China or Taiwan could, at that time, only be speculative. Since 1988, a large literature has arisen in which the chronological concept of an 'express train' has somehow become conflated with the geographical concept of an Austronesian homeland in Taiwan. This circumstance, for which Diamond cannot be blamed, has led to a situation of confusion. The term 'Express Train' should now be dropped from the Austronesian debate. The hypothesis that we espouse is better termed the 'Out of Taiwan hypothesis for Austronesian dispersal' (Bellwood and Dizon 2005).

We know today that the Austronesian dispersal *in its totality* was not really an express train – it required over 3000 years from the Neolithic settlement of Taiwan before settlers reached New Zealand (Map 1.1). Certainly, Austronesian dispersal involved some very rapid movements, but they were interspersed with long pauses. We agree that Diamond's metaphor was a useful one that has encouraged much productive debate, but the time has come to put the 'Express Train' firmly in its place as a description of the velocity of only one episode of Austronesian dispersal: the Lapita movement through Melanesia into western Polynesia. We need now to focus on the real issue of where Austronesian languages and cultures originated.

From an overall perspective, the only sensible way to understand the genesis of the Austronesian-speaking peoples is multidisciplinary, involving, at the very least, comparative linguistics, archaeology and biological anthropology (Bellwood 1997, 2005). This chapter focuses on the archaeological record of the initial period of Neolithic dispersal from Taiwan into the northern Philippines, about 4000 years ago. This archaeological movement was remarkably similar in its geographical directionality to the linguistic movement that gave rise to the Malayo-Polynesian subgroup, which includes all Austronesian languages spoken outside Taiwan (see



Map 1.1 The distribution of Austronesian languages, together with archaeological dates for the spread of Neolithic cultures. Beyond the Solomon Islands, Austronesian speakers appear to have been the first human populations.

Malcolm Ross, Chapter 6, this volume, also Ross 2005; Blust 1995, 1999; Pawley 2002). This differentiation probably took place a little after the break-up of Proto-Austronesian linguistic unity within Taiwan, and involved population movement from this island towards the south. Thus, Malayo-Polynesian might be a secondary subgroup of one of the several Taiwan primary subgroups, rather than a primary subgroup in its own right, but its significance as a record of Austronesian dispersal during the past 4000 years, more than halfway around the world, is immense.

Linguistically, the Malayo-Polynesian subgroup includes all of the 1000 or so Austronesian languages, apart from the 13 survivors in Formosan Taiwan. Archaeologically, it has been claimed by Bellwood (1997, 2004a) that the late third and second millennium BC distribution of red-slipped pottery and associated Neolithic material culture over a vast region including parts of Taiwan, the Philippines, Sabah, eastern Indonesia, Island Melanesia (Lapita), to as far as western Polynesia (Tonga, Samoa), records one of the major stages in the dispersal of the speakers of Malayo-Polynesian languages. This chapter investigates the archaeological commencement of this dispersal.

New discoveries in Taiwan and Northern Philippine archaeology relevant for Neolithic population dispersal into Indonesia and Oceania

The intention in this chapter is to discuss the new archaeological findings that are coming to light as a result of a major project on Itbayat Island and Batan Island, both in the Batanes Islands, northern Philippines, and to put them in perspective within the total picture of Neolithic spread in Island South-east Asia and Oceania. We also comment on some new archaeological data from Taiwan and the Cagayan Valley of northern Luzon. These new data make a 4000 BP Neolithic movement out of Taiwan into the northern Philippines a virtual certainty.

In south-western Taiwan, discoveries at Nanganli in the Tainan Science Based Industrial Park take the Taiwan Neolithic (Dabengkeng culture) back to *at least* 3000 BC, with ample evidence of incised, cord-marked and red painted pottery, rice and foxtail millet cultivation (carbonized grains), and pig and dog domestication (Tsang Cheng-hwa 2005). The current date of perhaps 3500 BC for the Neolithic settlement of Taiwan, a little younger than some previous estimates (for instance Bellwood 2000: 350), is nevertheless at least one millennium earlier than any well-dated Neolithic assemblages in Island South-east Asia. Clearly, Neolithic dispersal underwent a pause in Taiwan, perhaps for a thousand years.

Recent research in many regions of Taiwan, especially the southeast, indicates that the cord marked and incised pottery of the Dabengkeng phase had been virtually replaced by plain but red-slipped pottery by 2000 BC, with only lingering quantities of fine cord-marking after this date. This is particularly clear at Chaolaiqiao (c.2200 BC) and other sites along the southeastern coastline of the island (Hung 2005, 2008). It is from this phase, with red-slipped pottery predominating, and a utilization of Taiwan nephrite from the Fengtian source, that the first Malayo-

Polynesian populations left Taiwan for the islands to the south, travelling possibly via the small islands of Ludaο and Lanyu off southern Taiwan.

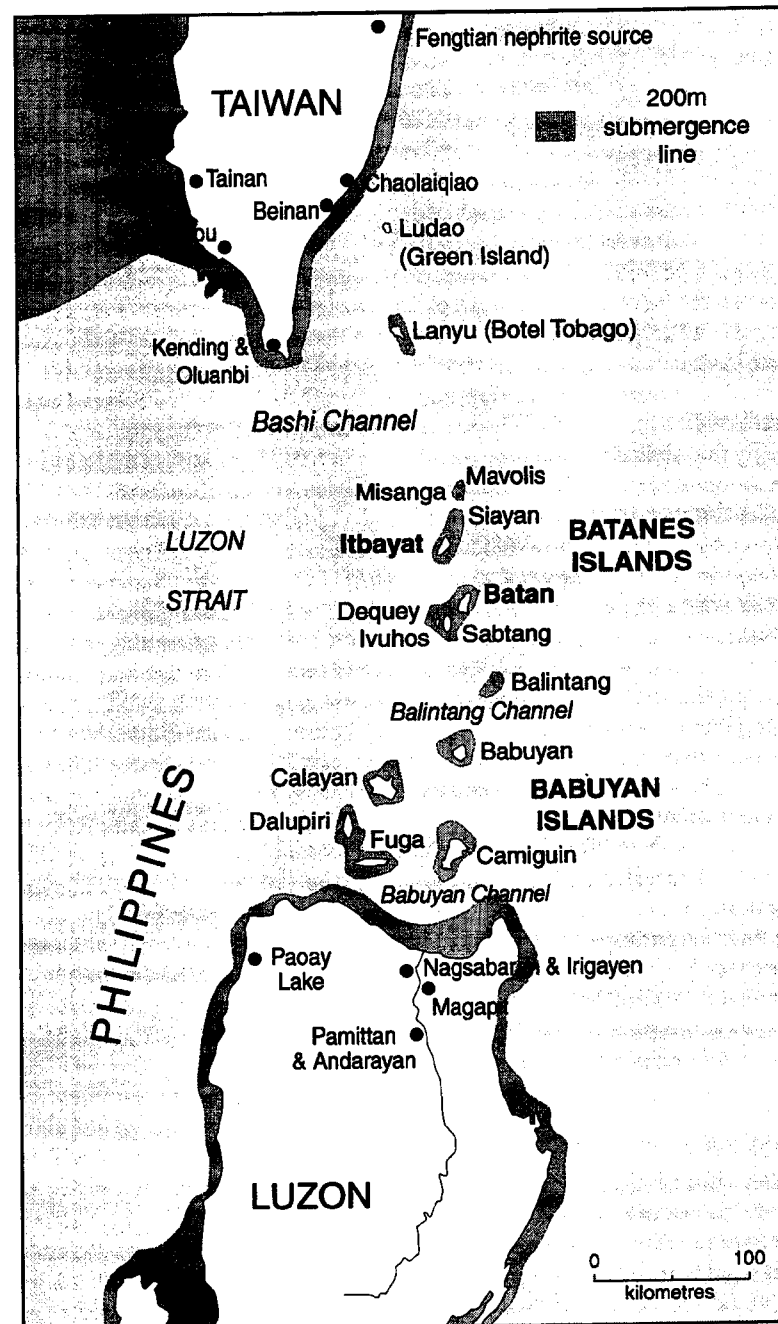
The overall Neolithic radiocarbon chronology for Island South-east Asia, prior to 3000 radiocarbon years ago, has been examined by Matthew Spriggs (2003). Chronological implications are that the Neolithic expansion into the northern Philippines was under way before 2000 BC, and by at least 1500 BC into eastern Indonesia, western Melanesia and the Mariana Islands of Micronesia. The latter movement, across 2000 km of open sea, was perhaps the first long-distance oceanic voyage recorded in human history. In northern Luzon, the possible source region for the movement to the Marianas, the existing Neolithic sequence in the open sites in the Cagayan Valley goes back to about 2000 BC (Hung 2005).

Of course, in talking about archaeological dates for earliest human settlement, there exists the question of how long, in statistical average terms, it will take archaeologists to find the oldest sites in any given area. Common sense dictates that early immigrant populations would have been small. Pioneer archaeologists will not find the oldest sites immediately unless they are extremely lucky, and will often be led astray by spuriously old C^{14} dates from peripheral locations that have been blessed with strong research profiles. An example of this comes from the record of Lapita discovery in western Oceania, with the early claim by biological anthropologist William Howells (1973) that ancestral Polynesians migrated through Micronesia into Fiji and Western Polynesia, avoiding most of Melanesia at first, partly because the C^{14} dates were oldest in Fiji at that time (Howells also, of course, relied on biological evidence to support his views). But now, after several decades of very intensive Lapita research, it has become clear that Lapita began in the far west of Melanesia (Bismarck Archipelago) at about 1350 BC, and only in actuality reached Fiji about 1000 BC or later (Green 2003). Radiocarbon dates can sometimes be misleading in cultural terms.

What of regions like the northern Philippines, where the relevant research is much newer? Have we found the very oldest sites here? Surely, we need to allow a couple of centuries in most South-east Asian regions to allow populations to grow to archaeologically visible sizes, particularly on very large islands such as Luzon, Sulawesi and Borneo. This, combined with the younger dating that has occurred with the increasing density of research on much smaller islands in western Polynesia and Fiji expands the dispersal chronology considerably, moving the dates backwards (older) before 2000 BC for the northern Philippines, but forwards (younger) towards 1000 BC for Fiji and Tonga (Spriggs 2003; Green 2003). This suggests a total time span of about 1000 years for Neolithic spread from Taiwan to western Polynesia, perhaps not quite an express train, although our suspicion from available C^{14} dates is that movement could have been very rapid indeed in some parts of the range. This step-like progression is discussed further below.

The Batanes Islands

The Batanes Islands lie 150 km from the southern tip of Taiwan and 200 km from the north coast of Luzon (Map 1.II). The open sea distance from Lanyu (off south-



Map 1.II The location of the Batanes Islands between Taiwan and Luzon.

eastern Taiwan) to Mavolis (northern Batanes) is about 100 km, and once this point was reached all other islands of the Batanes would have been intervisible. Since 2002, the two authors have been conducting archaeological research in these islands, with colleagues from the Australian National University, National Museum of the Philippines and the University of the Philippines (Bellwood *et al.* 2003; Bellwood and Dizon 2005).¹ This research has focused mainly on Batan and Itbayat Islands and takes us back to about 2000 BC.

As discussed elsewhere (Bellwood *et al.* 2003: 142), there was never a Pleistocene land bridge from Taiwan to Luzon via the Batanes because the intervening sea passages are too deep. So it comes as no surprise that, during four seasons of archaeological fieldwork in the Batanes, excavations in six caves and rock shelters (amongst other sites) have failed *absolutely* to give any sign of pre-ceramic occupation. All sites are sterile culturally below the lowest potsherds, and the islands have no trace of a pre-ceramic lithic industry. The Batanes were seemingly first settled by Neolithic populations moving from Taiwan with pottery, polished stone and developed maritime technologies, presumably the ancestors of the present Ivatan and Itbayaten populations.

This circumstance means that the Batanes have a very different kind of prehistory from, for instance, Luzon, or other islands in the Philippines and Indonesia where there were Pleistocene populations of hunter-gatherers using flaked lithics. In the Cagayan Valley on Luzon we have an interesting situation of interaction between incoming Neolithic and presumed indigenous hunter-gatherer populations. Archaeology reveals the roots of this interaction, because a hunter-gatherer (presumably ancestral Agta) human presence is attested in the Peñablanca Caves in the Cagayan Valley from at least 25,000 BP (Mijares 2005). In the Batanes, however, Neolithic populations arrived to find an apparently pristine landscape untouched by humans, as did the first Austronesians to enter Remote Oceania several centuries later.

As far as Batanes Neolithic archaeology is concerned, we now have a number of sites dating from about 4000 years ago and onwards, the older ones revealing some rather surprising connections with Taiwan. Because the Batanes cultural sequence has been discussed in some detail elsewhere (Bellwood *et al.* 2003; Bellwood and Dizon 2005), we only refer here to the four most significant sites that illustrate initial settlement from Taiwan, followed by continuing contacts afterwards for almost three millennia.

Torongon and Reranum Caves, Itbayat Island

The oldest assemblages known so far in the Batanes come from the interior of the Torongan sea cave on the east coast of Itbayat, and from Reranum Cave at the northern tip of the island. Torongan is about 100 m long, and was probably of great significance because it allowed access out to the sea from the interior of the island (the coastal cliffs here rise sheer about 80 m above the sea). The archaeological deposit is located about 13 m above the base of the cave, near the top of a high cone of fallen rock and soil piled against the south-western

wall of the inland mouth. The basal horizon contained sherds of plain and red-slipped pottery, otherwise undecorated, with everted and slightly concave rims paralleled closely in the site of Chaolaiqiao in south-eastern Taiwan (Figure 1.1). Reranum Cave, only excavated in 2006, has very similar pottery, together with a few fine cord-marked sherds, but we have been unable to get secure dating for this site owing to disturbance. Chaolaiqiao, securely dated by AMS C¹⁴ to 2200 BC, is a very important discovery because it establishes the presence of this horizon of predominantly red-slipped pottery in eastern Taiwan, here associated with nephrite working, close to the offshore stepping-stone islands of Ludaο and Lanyu. It also represents the virtual end of the fine cord-marked pottery tradition in south-eastern Taiwan (Hung 2005, 2008). The assemblage from Nagsabaran in the Cagayan Valley also has similar everted and concave rims to those from Chaolaiqiao (Figure 1.1).

The C¹⁴ dates on food residues and marine shells from Torongan Cave (Table 1.1) point to a chronology for initial occupation of Itbayat at about *cal.* 2000 BC, although there are younger dates from higher in the profile suggesting that the site was visited over a long period, indeed into the Ming dynasty according to a coin of the emperor Wan Li (AD 1583–1620) found just below the surface. Torongan also has four circle-stamped sherds with white lime or clay infilling amongst the otherwise undecorated plain and red-slipped sherds, similar to the sherds with stamped circles from Sunget and Anaro (below). However, these appear to be relatively late in the Torongan sequence. One specific item from Torongan with Taiwan affinity, found amongst the early pottery, is a waisted stone hoe of igneous or metamorphic rock.

Sunget, Batan Island

The Sunget site behind Mahatao on Batan Island (Site 56 in Koomoto 1983: 55) was discovered as a result of road construction in 1982. Excavations in 2002, 2003 and 2004 have shown that the cultural deposit lies about 10–30 cm below the surface of an old palaeosol, buried by ash from an eruption of Mt Iraya that occurred about 1000 years ago. We have two almost identical AMS dates on food residues inside potsherds that indicate a calibrated date for the assemblage between 1250 and 1000 BC, although charcoal dates also extend into the first millennium BC. The pottery style is quite unified in terms of rim forms and vessel shapes, so major use of the site might have been relatively short-lived, with occupation followed by cultivation of the site, as occurs today.

The Sunget material found by the Kumamoto University team in 1982 relates to assemblages of later Neolithic date in Taiwan, especially the Yuanshan and Beinan cultures of northern and eastern Taiwan (Tsang 2000: 75). The everted concave rims that continue from the older Torongan assemblage also relate to continuing assemblages of stamped and red-slipped pottery in the Cagayan Valley of northern Luzon (e.g. Magapit, Nagsabaran and Irigayen: see Hung 2005). All of these linkages fall generally into the period 1500–1000 BC. The Sunget pottery is mainly red-slipped and includes globular restricted vessels with everted

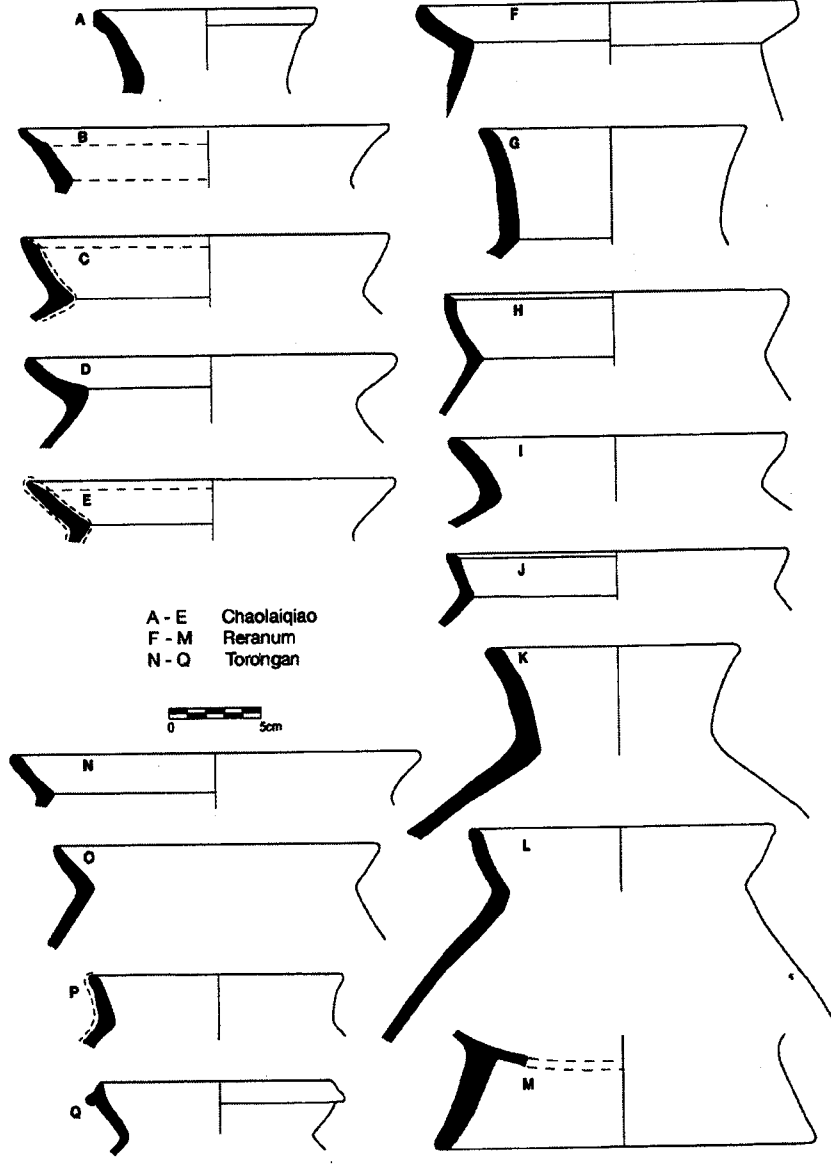


Figure 1.1 Pottery from Torongan and Reranut caves, together with similar pottery from Chaolaiqiao, north of Taidong, southeastern Taiwan (cal. 2000 BC); dotted lines indicate red slip.

Table 1.1 Radiocarbon dates older than 1000 bc for assemblages from Itbayat, Batan and Sabtang Islands, 2002 to 2006 fieldwork

LOCATION, SITE	CONTEXT	DATE BP	LAB NO.	OXCAL, 2 SIGMA
ITBAYAT ISLAND				
Torongan Cave*	Food residue on sherd at 55-60 cm (base of cultural layer)	3860±70	OZH 771	2500-2130 BC
Torongan Cave*	Tectarius shell at 55-60 cm	3880±40	OZH772	2025-1721 BC
Torongan Cave*	Food residue on sherd at 55-60 cm	3320±40	Wk 14642	1690-1510 BC
Torongan Cave*	Turbo shell at 50-55 cm	3352±35	Wk 14641	1384-1095 BC
Torongan Cave*	Thais shell at 45-50 cm	3663±41	Wk 15794	1737-1456 BC
Torongan Cave*	Marine shell at 40-45 cm	3470±50	OZH773	1522-1217 BC
Reranut Cave*	Square A, 25-30 cm, Turbo argyrostomus marine shell	3253±47	Wk 19715	1390-900 BC
Anaro hilltop site*	Area 3, 95-105 cm, food residue on sherd	2770±50	OZH774	1040-810 BC
BATAN and SABTANG ISLANDS				
SUNGET PHASE				
Sunget Top Terrace*	Layer 5, 15-20 cm within layer, resin coating on sherd exterior	5790±150	OZH776	Not calibrated (fossil resin)
Sunget Top Terrace*	Layer 5, 20-30 cm within layer, food residue in pottery	2910±190	ANU 11817	1700-500 BC
Sunget Main Terrace*	Layer 5, 15-20 cm within layer, food residue in pottery	2915±49	Wk 14640	1270-970 BC
Savidug Jar Burial Site*	Layer 4, 180 cm below surface, charcoal with Sunget style pottery	2828±37	Wk 19711	1120-900 BC

Waikato dates have been calibrated by the laboratory using Oxcal versions 3.8 and 3.10. For the other Batanes dates we have used Calib Rev. 5.0.1, with a delta R for marine shells of 18±34 from coral core data, Xisha Island, Paracel Islands (Fiona Petchey, Waikato C14 Lab, pers. comm. 20/11/06). Asterisked dates are AMS.

tall and unthickened rims (Figures 1.2a–d, f–h), some placed on tall ring feet and provided with vertical handles, together with open bowls with direct rims decorated externally with zones of close-set stamped circles (Plate 1.I), forming what appear to have been rectangular meanders in horizontal bands.

Sunget has also produced two biconical spindle whorls, one decorated with stamped circles, perhaps used to spin strong fibres such as those from the leaves and hard leaf stems of *Musa textilis* (*abaca*, Manila hemp) or ramie (*Boehmeria nivea*) (Judith Cameron personal communication). The biconical morphology links the whorls to many contemporary Neolithic sites in northern and eastern Taiwan. Rare but similar biconical whorls also occur in 2nd millennium BC Cagayan Valley sites such as Andarayan (Cameron 2002).

Other Sunget artefacts include large numbers of notched and flat ovate pebble 'sinkers' of a type also common all over Taiwan from Dabenkeng times onwards; a Fengtian (eastern Taiwan) nephrite adze and a slate projectile point, and a few stone adzes of shouldered and stepped types. However, as noted above, one remarkable virtual absence from Sunget, indeed everywhere in the Batanes, is any evidence for flaked stone tools – presumably chert-like materials were so scarce that the community depended entirely on polished stone. It is also of course likely that these people belonged to a cultural tradition that had long since lost interest in purely flaked stone technology, as in much of Neolithic China and Taiwan. To

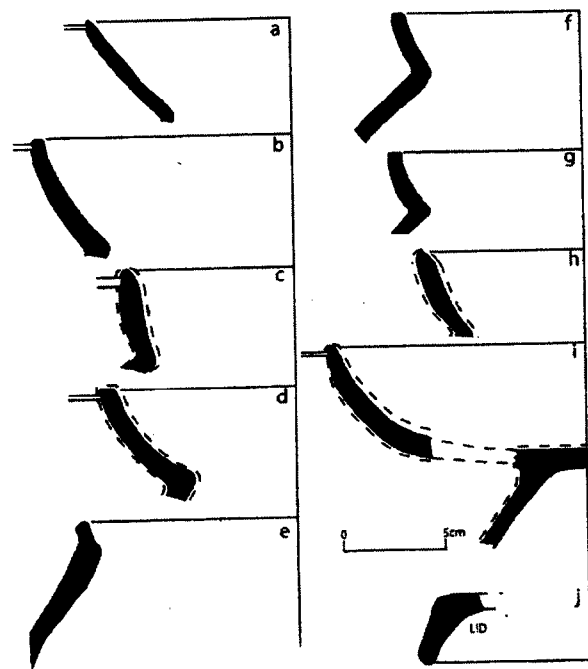


Figure 1.2 Vessel rims from Sunget. Dotted lines indicate red slip.

those accustomed to excavating Neolithic sites in eastern Indonesia or Melanesia this absence of flaked lithics seems strange, and it obviously emphasizes that in the latter areas there was considerable carry-over of indigenous technology into the Neolithic.

Anaro, Itbayat Island

The Anaro site runs on terraces around the summit of the Anaro flat-topped limestone 'mesa', about 200 m long and 20 m wide, left upstanding between a series of surrounding incised valleys. The archaeological deposits have been heavily eroded in some places, and on the lower slopes of the hill a remarkable density of strewn artefacts can be found in a number of fields cleared for cultivation. These surface artefacts include pottery sherds (some with stamped circle patterns like Sunget), many broken adzes of pale grey metamorphic rock (some tanged), stone barkcloth beaters, pottery spindle whorls, pig bones, broken tools of Taiwan slate, and pieces of drilled and cut Fengtian nephrite (Plate 1.II).

Several locations around the top of Anaro have been excavated since 2004, and we now have (including surface finds) a remarkable number of items imported from Taiwan; pieces of Taiwan slate probably used to groove and snap nephrite using quartz sand, nephrite adzes, nephrite discs and an array of shaped nephrite debitage that appears to represent a full reduction sequence for the manufacture of the *lingling-o* type of jade earring with three circumferential projections (Bellwood and Dizon 2005; Hung 2005: figure 8). All of the nephrite analysed so far from Anaro has been sourced to the Fengtian source near Hualien, in eastern Taiwan (Iizuka *et al.* 2005; Hung *et al.* 2007). The slate and nephrite pieces excavated from the locations termed Anaro 2 and 3 are associated with C^{14} dates which extend from AD 700 back to almost 1000 BC, and further dates are in process.

Much of the Anaro slate and nephrite is of Early Metal Phase (Iron Age) date, and thus not relevant for Neolithic dispersal issues. We do not yet have nephrite or slate items from Torongan, but a small Fengtian nephrite adze and a slate point were found in 1982 at Sunget, presumably dated to *cal.*1000 BC (see Koomoto 1983: figure 25). The basal spit of Anaro 3 also produced an ear pendant of shell of a very precise Beinan type (south-eastern Taiwan), also C^{14} dated to almost 1000 BC. So, there can be little doubt that both slate and nephrite were in circulation in the Batanes by at least 1000 BC, if not before.

The real significance of all the Anaro slate and nephrite is that it demonstrates *direct* contact between the Batanes and Taiwan, perhaps via Luda and Lanyu, starting by at least 3000 years ago. This observation matters, because artefacts of Taiwan slate have not been found in northern Luzon, and Taiwan nephrite artefacts here are rare. So it is impossible to believe that this nephrite and slate all travelled from Taiwan to Luzon, then back northwards to the Batanes. Both Solheim (1984–5) and Anderson (2005) have suggested that direct sailing from Taiwan to the Batanes would have been very difficult for Neolithic populations, owing to the presence of the north-flowing Kuroshio Current. The Sunget and Anaro nephrite and slate evidence tends to refute this view.

Hung Hsiao-chun (2005, 2008) has also been able to show that artefacts of Taiwan nephrite, such as bracelets and beads, occur in a number of Neolithic sites in Luzon dating back as far as 1800–1500 BC, including Nagsabaran in the Cagayan Valley, sites in Batangas Province, and possibly Dimolit in Isabela. The movement of Taiwan nephrite into the Philippines was thus occurring potentially as early as 2000 BC on a wide scale, and might have continued, expressed in changing artefact fashions, for three millennia. But none of these Luzon sites have anything like the quantity of nephrite found in Anaro, and they lack slate. They do not indicate colonizing movements from Taiwan to the Batanes via Luzon.

From Taiwan to the Batanes

The evidence from Torongan, Reranam and Sunget, dated to between 2,500 and 500 BC at outer limits, makes an eastern Taiwan to the Batanes (and Luzon) north-to-south directionality of the Neolithic colonization process very likely. This evidence includes:

- (1) the red-slipped pottery from Torongan and Reranam Caves, dated to *cal.* 2000 BC, which resembles in rim forms the pottery from Chaolaiqiao in south-eastern Taiwan, dated to *cal.* 2200 BC;
- (2) the fine cord-marked sherds from Reranam Cave
- (3) the Sunget vertical handles, biconical baked clay spindle whorls, notched stone sinkers and the artefacts of slate and Fengtian nephrite, indicating direct contact with Taiwan at about 1000 BC;
- (4) the large quantities of Taiwan slate and Fengtian nephrite from Anaro, plus some Anaro stone adzes that appear also to be imports from Taiwan, all dating from 1000 BC onwards;
- (5) the bones of domesticated pigs from at least 3000 BP in Sunget (Torongan and Reranam have no preserved animal bone). The Batanes have no evidence for a pre-human wild pig population, and the wild pig of Luzon, *Sus philippensis*, was apparently never domesticated (Groves 1997).

Evidence for contemporary contact with northern Luzon, which was presumably reached by Neolithic settlers from Taiwan at about the same time as the Batanes Islands, includes many of the Anaro stone adzes with trapezoidal cross-sections (some tanged), mostly of pale grey metamorphic rock. These are paralleled closely in some Cagayan Valley sites with red-slipped pottery, such as Irigayen. Also of non-Taiwan origin may be the habit of decorating pottery with zones of stamped circles (from Sunget and Anaro onwards, but apparently not yet innovated in the basal layer at Torongan). Indeed, one wonders if this Batanes circle stamping formed the background to the development of both circle and dentate stamping in the Neolithic of the Cagayan Valley, and ultimately to the early Marianas and Lapita dentate- and circle-stamping traditions. At present, the chronology is not tight enough to resolve this issue, and it is, of course, quite possible that innovations flowed back as frontiers extended, as in the case

of the Talasea obsidian from New Britain found in the early red-slipped pottery assemblage at Bukit Tengkorak in Sabah (Bellwood and Koon 1989). However, derivation of the whole Neolithic complex present in the Batanes and Cagayan *from the south* is to our minds completely impossible. We now have enough C¹⁴ dates from the Batanes and Cagayan, detailed in Table 1.1, to give this region an edge of at least 500 years over the beginning of the Lapita sequence in western Melanesia.

The movement of population from eastern Taiwan into the northern Philippines, probably between 2500 and 2000 BC on present evidence (Hung 2005), formed the first stage in an astounding spread of a Neolithic population that reached western Polynesia by only a millennium or so later, traversing a maritime distance of almost 10,000 km (Bellwood 1997, 2004a, 2004b, 2005). Until now, it has been possible to argue *in vacuo* that many Austronesian-speaking populations, such as Polynesians, could not have originated in Taiwan because there is no relevant archaeological record in support (Oppenheimer 2004; Oppenheimer and Richards 2001). Such arguments can only be made if one ignores the linguistic and archaeological records altogether, or makes the historically unsupported assumption that the Austronesian languages spread as ‘trade languages’, without native speaker transmission (see Malcolm Ross’s chapter in this volume for a firm statement against this possibility). Clearly, it is true that not all Austronesian-speaking populations originated *genetically* in Taiwan – no one would make this claim, for instance, for many eastern Indonesian or Melanesian populations, or even for the Agta of northern Luzon. But to extend this argument to the languages and material cultures of Austronesian prehistory and to deny Taiwan’s role in their origins, as done by Oppenheimer (2004), is completely counter-productive. Indeed, Oppenheimer’s only genetic weapon, his assumption based on mtDNA molecular clock calculations that Polynesians are derived from Palaeolithic eastern Indonesians, is now under very strong attack (Cox 2005; Trejaut *et al.* 2005; Pierson *et al.* 2006; Penny 2005). The relationships between the archaeological and linguistic data pertinent to Malayo-Polynesian dispersal are not the results of circular reasoning, as Oppenheimer (2004) asserts, but of the independent analytical strengths of the relevant databases and the determination of other scholars to take these databases into account.

The timing of Neolithic spread: southern China to Taiwan, then to Polynesia

In actuality, Diamond’s Express Train metaphor fits well when applied to a part of the Austronesian dispersal, especially the region from eastern Taiwan, through the Philippines and eastern Indonesia, into the western part of Polynesia (Tonga and Samoa). It fits the archaeological and linguistic records, which are unanimous in reflecting rapid dispersal in some regions, as for instance the route from Sulawesi through the Moluccas into Island Melanesia. This dispersal appears to have taken place in under a millennium.

In his 1997 book, Bellwood reconstructed the chronology of Austronesian dispersal from Taiwan into the western Pacific as follows:

During the late fifth or fourth millennium BC colonists from the mainland of southern China (probably Zhejiang or Fujian) settled Taiwan ... During the third millennium BC colonists moved into Luzon, and the Malayo-Polynesian subgroup now began its separation from the other primary subgroups of Austronesian which remained on Taiwan ... By at least 2000 BC Proto-Malayo-Polynesian began to break up, probably with settlement expanding in various directions into the southern Philippines, Borneo, Sulawesi and the Moluccas.

(Bellwood 1997: 241–2)

Since the above was written, many new excavations have been carried out in Taiwan and the northern Philippines, reinforcing this general pattern very strongly. Matthew Spriggs updated the C¹⁴ evidence in 2003 to suggest Neolithic settlement of Taiwan between 3500 and 3000 BC, followed by movement to the Philippines about 2000 BC, to Talaud and Sulawesi by 1600 BC, and to the Moluccas and East Timor by 1500 BC. According to Spriggs (2003), the beginnings of Lapita in the Bismarcks occurred between 1500 and 1350 BC, and reached the Solomons by 1050 BC. Western Polynesia appears to have been reached by 1000–800 BC.

In 2004, Bellwood published a graph to illustrate just such a chronology (Bellwood 2004b: figure 3.2), and this is reproduced here as Figure 1.3. No attempt is made to 'smooth' this graph by imposing a curve over the points, and it is intended to illustrate what in reality could have been a very step-like progression of human colonization, with periods of relative stasis interspersed with periods

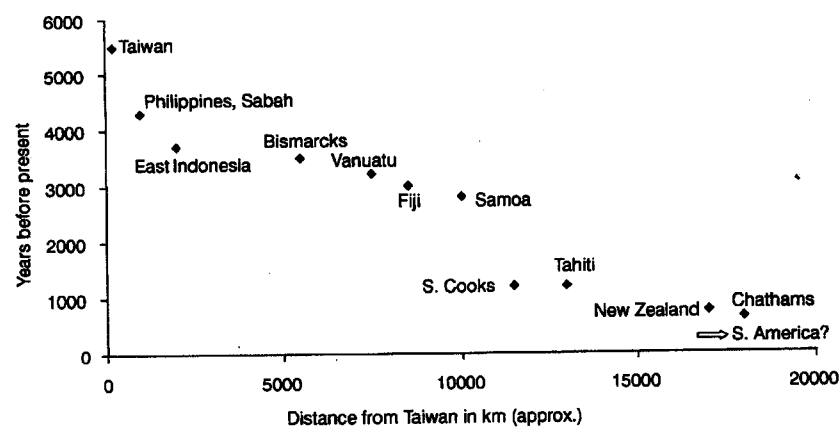


Figure 1.3 A graph to show Austronesian dispersal distance (in thousands of km) out of Taiwan, versus C¹⁴ dates for initial settlement (Reproduced from Bellwood 2004b, with permission from the McDonald Institute for Archaeological Research, Cambridge).

of rapid and far-flung movement. We can see that two periods of relative stasis occurred: in Taiwan between 3500 and 2500/2000 BC, and in western Polynesia between 800 BC and about AD 600. In between, rapid moves occurred from the Philippines to the Bismarcks between about 2000 and 1350 BC, and on to Samoa by 800 BC. Later on, movement occurred from western Polynesia through the whole of eastern Polynesia between AD 600 and 1250 (this progression is also detailed in Map 1.1).

Bellwood (2005: 276) has recently summarized the Neolithic movement from the Philippines to Samoa as occurring over a period of 1000 years, between approximately 1800 and 800 BC, involving an average spread rate of 8.5 km per year, obviously mostly over water and hence very fast in world terms. That book was written before the new dates were acquired from the Batanes, and if the settlement of the Batanes is pushed back beyond 2000 BC, the rate of spread correspondingly slows down a little over the total haul. But the movement from Sulawesi to the Bismarcks, about 3500 km, could on present evidence have taken place within a couple of centuries, between 1500 and 1300 BC, and this gives a very rapid rate indeed: 18 km per year on average.

Demic diffusion as a process of population movement has been out of fashion amongst archaeologists for a long time now. In the Austronesian arena we need to bring it back, in moderation, as a process that postulates periodic increases and movements of population reflecting technological, economic or social stimuli, combined with continuous population admixture along an expanding migration front (as discussed clearly by Cavalli-Sforza 2002 and in modified form by Renfrew 2002). As postulated by Cavalli-Sforza, demic diffusion theory should apply very well to tribal, Neolithic, illiterate, pre-bureaucratic and pre-globalized populations undergoing demographic increase in a situation of finite resources in their home territories. The rate of expansion of Neolithic cultures discussed above can be equated reasonably with a process of demic diffusion: generation by generation population increase, combined with movements that were sometimes slow, sometimes saltatory as people jumped water gaps. Were the Austronesian/Neolithic expansion to have been the result of no more than mere trade or 'cultural diffusion', without movement of people, then we might expect the process to have been far quicker – Taiwan to Tonga in a few centuries perhaps, rather than a millennium. But, of course, it did not happen that way.

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