

A Critique of the ‘AD 1300 Event’, with Particular Reference to Palau

Scott M. Fitzpatrick¹

ABSTRACT

In several recent publications, scholars have postulated that a widespread climatic change, termed the ‘AD 1300 event’, caused massive social disruption in the Pacific Basin, including resource depletion, increased conflict and cannibalism, the establishment of fortified settlements, changing settlement (coastal to inland) patterns, and an end to ocean voyaging. Although the role of the environment in influencing social behaviour is certainly an avenue of research that should be explored, this environmentally deterministic model is not supported by empirical findings. Palau, used as one of the examples to support the model, is considered here to show that there is in fact a great deal of archaeological and palaeoenvironmental evidence suggesting the inverse of the proposed model.

Keywords: climate change, AD 1300 event, Pacific Basin, societal collapse

INTRODUCTION

A series of papers published over the last 10 years has suggested that there was widespread societal change in the Pacific Basin during the transition between the so-called Medieval Warm Period (MWP) (ca. AD 700–1250) and the Little Ice Age (LIA) (ca. AD 1350–1800). Termed the ‘AD 1300 event’ (Nunn 2000, 2007; Nunn & Britton 2001; Nunn *et al.* 2007), this transitional climatic period, characterized by ‘rapid cooling and sea-level fall’ (Nunn *et al.* 2007: 385), is argued to have caused massive and widespread societal disruption, including resource depletion, increased conflict and cannibalism, the establishment of fortified settlements, changing settlement (coastal to inland) patterns, and an end to ocean voyaging. However, an abundance of archaeological data suggests that Pacific Island societies were not reacting to this supposed event – in fact, in many cases the inverse appears to be true. In addition, palaeoenvironmental studies indicate that Holocene warming and cooling trends for the Pacific were more localized or regionalized than the AD 1300 proposition suggests and also much more variable across the period in question.

Given that papers concerning the ‘AD 1300 event’ have gained wide traction in the literature – yet with little critique – it has become necessary to highlight some of the inherent problems surrounding this model in the hope that attention can be diverted to more intensive analyses of the various phenomena involved and encourage broad-

er discussion of alternative hypotheses. To address this issue, I briefly summarize the issue of climatic change in the Pacific Basin that led up to the supposed ‘AD 1300 event’. I then use the Palauan archipelago as a case study, suggesting that many of the expected societal changes either occur outside the AD 1300 window or are nonexistent. The conclusion here is that the overarching environmentally deterministic ‘AD 1300 event’ model is not well founded for the Pacific as a whole as it includes only a small portion of the available data for the region and ignores a large corpus of information that is contrary to what it proposes. Societal changes seen in the Pacific Basin during this time could potentially have been influenced in differing degrees but they do not indicate, nor have they ever been plausibly indicative of, the operation of a region-wide climatic event around AD 1300.

THE CASE FOR SOCIETAL DISRUPTIONS IN THE PACIFIC ISLANDS

A decade ago, Nunn (2000: 716) developed an argument to ‘determine whether the AD 1300 climate change was a Pacific-wide phenomenon demanding a regional explanation or not.’ His conclusion, after a review of both sea-level data and environment-human data, was that ‘the AD 1300 event affected the entire Pacific Island region and, as such, demands a regional explanation rather than the local ones which have been offered to date’ (Nunn 2000: 736). A series of papers and monographs since then, including Nunn & Britton (2001), Nunn (2003a, 2003b, 2007), and Kumar *et al.* (2006) have explored this issue. A more recent paper (Nunn *et al.* 2007: 385) states that the societal disruption associated with the AD 1300 event was due largely to a massive and rapid reduction of the food

¹ Department of Sociology and Anthropology, North Carolina State University, Raleigh, NC, 27695, USA.

Corresponding author: scott_fitzpatrick@ncsu.edu

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resource base on which many Pacific communities had come to depend during the preceding MWP. Nunn *et al.* (2007) link food resource depletion to rapid cooling and sea-level fall. To support their argument, they construct case studies about the prehistory of Fiji, Kaua'i (Hawaiian Islands), Easter Island (Rapa Nui), New Zealand, and Southern Queensland (East Australia), and refer as well to other islands in which societal changes during this time are perceived.

As this is a preliminary paper, I am concerned here only with the Palauan archipelago, one of the case studies used by Nunn (2000). I argue that the proposed model of environmental catastrophe is ill-conceived because it relies on a set of climatic conditions that have been shown to be extremely variable and for which the supposed societal effects are not, in fact, evident in the archaeological data.

CLIMATE CHANGE DURING THE LATE HOLOCENE

In a recent review of climate variability in the central Pacific, Allen (2006) notes that scientists have long assumed, incorrectly, that conditions in this region during the Late Holocene did not diverge from the Northern Hemisphere where there is evidence of two major climate periods: the MWP and the LIA. Increased resolution and spatial coverage of palaeoenvironmental data from the Pacific Basin and elsewhere, however, has provided researchers with a much improved database with which to make comparisons locally, regionally, and globally (Bradley & Jones 1993; Allan & D'Arrigo 1999). The collation of data now suggests that conditions in the Pacific were much different than once thought.

Allen (2006: 521) remarks that '[i]n the central Pacific, both observational studies and climate modeling now suggest that the MWP was relatively cool and the LIA relatively warm, the inverse of Northern Hemisphere conditions. Further, other parameters of climate may have been variable within the Central Pacific region.' This is contrary to arguments put forward by Nunn *et al.* (2007) although it is important to note that even though the palaeoclimate records of various regions in the Pacific such as Palmyra are the opposite of what Nunn proposes, this does not mean that localized cooling conditions around AD 1300 did not occur. In addition, as Allen (2006: 527) notes, 'a marked temperature increase could have been as disruptive for Pacific peoples as a decline, given the sensitivity of tropical reefs to thermal stress,' just not in the same way as has been postulated. Allen (2006: 527) goes on to say that 'the emerging evidence indicates that palaeoclimate conditions in high latitude New Zealand (the basis for Nunn's temperature reconstruction) were similar to those of the Northern Hemisphere and thus may be a poor basis for reconstructing central Pacific climate.'

Jones *et al.* (1998) and Jones & Mann (2004) in their reviews of palaeoclimate records and proxy temperature fluctuations from the Northern Hemisphere actually show

that there is 'little evidence for a discrete MWP' (Allen 2006: 527) and that 'several global regions showed considerable variation in the timing, magnitude, and intraperiod variability of both the MWP and LIA' (Allen 2006: 527–528). Given these factors, Allen (2006: 529) concluded that it is possible that 'no one model will adequately explain climate patterns in the Pacific as a whole, particularly at the resolution needed to understand the impact on and responses to human populations.'

In sum, the climatic characteristics surrounding the 'AD 1300 event' that Nunn *et al.* (2007; see also Nunn 2000, 2003a, 2003b, 2007; Nunn and Britton 2001; Kumar *et al.* 2006) use as the foundation for their analysis of societal disruption in the Pacific Basin appear to be highly variable. As one reviewer of the current paper noted, it is probable that climatic patterns such as the MWP and LIA would be extremely subtle in tropical palaeorecords given the ameliorating effects of the ocean on temperature. Even during the coldest years of the LIA, the temperature would have been only about 2° C colder than normal – given that there was considerable variability in climate from year to year, temperatures would not have been uniformly depressed. If the LIA was actually warmer and wetter than previously thought, and recent palaeoenvironmental data seem to support this, then many of the changes described by Nunn *et al.* (2007) such as the appearance of new techniques for storing root crops on Tikopia, reduction in the productivity of coastal lands and offshore reefs in Hawaii, decline of pearl shell fishhooks on Aitutaki (Cook Islands), lowered terrestrial productivity on Rapa Nui (Easter Island), and a decline in inter-island voyaging Pacific-wide, would be the result of a combination of other social and environmental factors, including locally fluctuating climate.

THE PALAUAN CASE-STUDY

The Palauan archipelago in western Micronesia is cited by Nunn (2000) and Nunn *et al.* (2007) as one of the 'AD 1300 event' case studies. Quoting research by Parmentier (1987: 29) and Masse (1984: 117), Nunn (2000) suggests that the larger volcanic islands (primarily Babeldaob and Koror) were abandoned for the smaller, limestone 'Rock Islands' around AD 1200 after a period of agricultural intensification (Nunn 2000: 727 after Parmentier 1987: 29). This population movement is attributed to the effects of ongoing warfare, as suggested in oral traditions. Nunn *et al.* (2007: 386–387) also note that 'food resources in many areas having been significantly reduced by the effects of cooling and sea-level fall...[are] supported by considerable data, including detailed case studies from Fiji and Palau (Kumar *et al.* 2006; Masse *et al.* 2006)' (embedded references left intact).

Several important points should be made here. The first is that although Masse *et al.* (1984, 2006) do show more intensive occupation of the Rock Islands around AD 1200–1600, which is generally coincident with the

abandonment of artificially constructed terrace sites in the interior of Babeldaob by ca. AD 1000 (Liston 2009), this desertion is also coincident with the construction of stonework villages along the coast (Wickler 2002). People were not moving exclusively to the smaller and seemingly more peripheral limestone islands. Settlement instead began focusing on locations with better coastal access throughout the archipelago, not to mention lands near the newly formed (due to erosion from terrace building) lowland hydromorphic soils, which became important for wet taro farming (Masse *et al.* 2006). Liston & Tugle (2006) provide a review of Palauan warfare based on oral traditions and archaeological remnants, noting that the movement to these stonework villages included the construction of different types of defensive fortifications. However, defensive works appear to have been commonplace through time in Palau (e.g., the larger earthwork terraces) (Liston 2009), and certainly not relegated to the second millennium AD; ‘One of Nunn’s climate-induced cultural changes is the start of warfare, yet it is apparent that this was endemic in Palau, with some of the most spectacular defensive features associated with the earthwork era of ca. 500 BC to AD 650’ (Masse *et al.* 2006:128).

The argument by Nunn *et al.* (2007) that many coastal settlements were abandoned during the LIA for naturally defensible sites (particularly hilltops or caves), also has little currency for Palau. In fact, the opposite occurs – inland terrace sites were established between about 200 BC and AD 1000 and villages then became common along coastlines around AD 1100–1200 (Wickler 2002). The use of caves also has a long antiquity in Palau. They were used as burial sites by at least ca. 800 BC (Fitzpatrick & Nelson 2008) and for what appears to be semi-sedentary fishing camps from at least AD 300 to the historic period (Fitzpatrick & Kataoka 2005), if not earlier.

In terms of a reduction in food resources, Nunn *et al.* (2007:387) cite Masse *et al.* (2006) who observed a trend between AD 1200–1600 of fish and molluscan resource depression at sites in the southern part of the archipelago. It is important to note that these data cover only a short temporal range in one geographical locale within an archipelago that stretches for over 150km. They do not provide a good baseline for examining pre-AD 1300 activities over a wider area. Data from the Chelechol ra Orrak site, for example, suggest that fishing declined over time (Fitzpatrick & Kataoka 2005; Fitzpatrick *et al.* n.d.). It is quite possible that as human populations grew, this taxed local animal populations increasingly (coincident with the transition to more intensive agriculture), and that this was more significant than any overarching climatic change. It should be noted too that humped conch (*Strombus gibberulus*) specimens from Orrak (one of the species used by Masse *et al.* (2006) to infer overharvesting as they decline in size over time), actually *increase* in size at the site over a larger temporal range of ca. 3000 BP to the present, perhaps as a result of a more favourable habitat created by

agricultural runoff (Giovas *et al.* n.d.).

Overall, Masse *et al.* (2006) themselves note that they find some support for the AD 1300 model, but that other lines of evidence for impacts such as Palau’s sedimentary record are ‘tenuous, contradictory, or non-existent, depending on how the data are weighted and interpreted’ (Masse *et al.* 2006:128).

In sum, there is no equivocal evidence that:

[t]he history of gross population movement and warfare in Belau [Palau] over the last millennium can be explained by an environmental catastrophe around AD 1200 which destroyed much of the resource base (reefal-near-shore and upland) and led to conflict within the high islands and their abandonment for more easily defended islands offshore until a time during the drier Little Ice Age when the resource base on the high islands had recovered, and people consequently felt less threatened by other groups (Nunn 2000:728).

In any case, this process seems illogical. If climate change destroyed the resource base, particularly coral reef environments as a result of cooling and sea-level fall, this would render the marginal environments of the Rock Islands even less habitable. Agricultural yields on Babeldaob would likely have been much more resistant to the effects of sea-level change than would the limestone islands where reef environments would be exposed by a decline in sea-level. In a recent study, Sachs *et al.* (2009) analysed marine lake sediments from several locations near the equatorial Pacific, finding that the climate in Palau was drier between AD 1420–1560. Decreasing precipitation would likely have been a factor influencing the abandonment of the Rock Islands due to a loss of potable water and, or, decline in plant cultivation.

It is argued here that: there was continual use of many Rock Islands over the past 2000–3000 years; general population movements were from inland to coastal areas beginning around AD 1200; caves were used by Palauans over several millennia; and local impacts to resources such as fish and shellfish are not clustered to any particular period, having occurred, perhaps gradually, over a larger swathe of time since at least the first millennium AD. Although climate change cannot be ruled out as influencing social behaviour (e.g., abandonment of various islands and occupations of others), there is nothing in the Palauan data to support the operation of a supposed ‘AD 1300 event’.

OTHER ‘AD 1300’ PHENOMENA

The societal disruption model postulated for the Pacific Basin by Nunn *et al.* (2007; also Nunn 2000) suggests some defining characteristics on islands that should be (or can be) identifiable in archaeological and ethnographic records. Among these are resource depletion, increased conflict and cannibalism, the establishment of fortified

settlements, changing settlement (coastal to inland) patterns, and an end to ocean voyaging. According to Nunn (2000, 2007; Nunn *et al.* 2007), environmental changes that caused stress to the productivity of food resources were the catalyst for increased conflict and cannibalism in the Pacific Basin. Archaeological manifestations of conflict between groups might include the construction or expansion of defensive fortifications, massive population movements to new areas, heightened levels of warfare (e.g., human remains with evidence of trauma), and cannibalism as peoples resort to ritual sacrifices or starvation foods.

Although it is beyond the scope of this paper to address each and every case individually, a few descriptions of these occurrences are worth noting: ‘The rise of cannibalism at this time can be explained largely as an expression of conflict’ (Nunn *et al.* 2007: 387). ‘Intertribal warfare and cannibalism became widespread, conditions that endured for much of the Little Ice Age’ (Nunn 2000: 717). These are curious statements, however, considering that cannibalism, although a practice observed historically on some islands, has rarely been documented archaeologically in the Pacific.

DeGusta (1999, 2000), in a critical and detailed analysis of two assemblages from Fiji that were reported by earlier scholars to show evidence of cannibalism, supports the claim in the case of the Navatu site, but not Vunda. It is worth mentioning that all of the remains at Navatu date earlier than AD 1300 or have large standard errors (± 300 or ± 500), and that evidence of cannibalism (e.g., cut-marks, percussion pits, peeling, crushing) occurs in the same low relative frequencies through the Early, Middle, and Late Periods (DeGusta 1999: 218). Despite a lack of good archaeological evidence, cannibalism is reasonably well documented in the historical literature for Fiji and New Zealand, and was mentioned by Parmentier (1987: 87) for Palau. These cases demonstrate that cannibalism is not well documented archaeologically or even known to be widespread historically in the Pacific and, in addition, where cannibalism can be demonstrated, it is known to occur over a wide temporal range and is not restricted chronologically to around AD 1300. Indeed, historically, some of the most sustained and widespread cannibalism in Fiji, New Zealand and elsewhere was recorded as associated with the new kinds of warfare that followed the introduction of European firearms.

Nunn *et al.* (2007: 387) also argue that ‘...long-distance interactions between different groups of people for the most part ended during the early part of the Little Ice Age in many parts of the vast region.’ The lack of renewal of significant Pacific-wide prehistoric ocean voyaging after about AD 1500 is interpreted as a result of (a) the conflict that pervaded many Pacific societies at the time, (b) the establishment of upland/inland/offshore settlements and less marine-dependent lifestyles, and (c) a loss of seafaring and navigational expertise (Nunn *et al.*, 2007: 397).

There are certainly cases where seafaring in the Pa-

cific diminished, but this was highly variable and likely waxed and waned through time. In the case of western Micronesia, long-distance interaction occurred prior to, during, and after AD 1300. The development of the *sawei* exchange system, for example, which began as early as perhaps AD 600–800 (Descantes 1998), was one of the most widespread exchange networks known in the Pacific. This network involved voyages to Yap (specifically, the Gagil district) by the eastward lying Outer Islanders to engage in reciprocal hospitality and the exchanging of gifts, including bamboo, Polynesian chestnuts, *Tridacna* shells, canoes, turmeric, coconut products, fish, iron, mother-of-pearl shells, *Spondylus* shells, and many other items (e.g., Hunter-Anderson & Zan 1996; Descantes 1998). These voyages originated from hundreds of kilometers away and involved numerous islands, including Lamotrek, Wottagai at Wolei, Fais, and Falalup and Mogmog in Ulithi which were connected to Palau in an even greater interaction sphere as part of the stone money exchange system (Fitzpatrick 2008). The presence of Palauan ceramics on islands to the north such as Fais and Ngulu (Intoh and Dickinson, 2002; Dickinson and Shulter, 2000; 223, 235) generally support the continuity of ocean voyaging within the region. In fact, it seems to have increased after AD 1200.

CONCLUSIONS

I am not advocating an approach to examining Pacific Island societal change that completely disregards climatic change. To the contrary, climate change has played an important role in structuring human behaviour in many parts of the world at different points in time, including the Pacific. For example, Finney (1985) and Anderson *et al.* (2006) propose ways in which El Niño-Southern Oscillation (ENSO) events might explain the punctuated pattern of migration in Remote Oceania during the Late Holocene, while Allen’s (2010) work on the last few centuries of occupation in the Marquesas provides much of interest about how social processes might be affected by various climatic events. Further, as Nunn *et al.* (2007) and deMenocal (2001) note, there are many cases worldwide where abrupt, short-term, or long-term climatic fluctuations seem to have influenced human societies in a myriad of ways.

However, Nunn’s approach for the Pacific Basin goes too far in the case of Palau, and likely so in the examples of many other island groups which he cites, because it is based on implausible assumptions. These are: (1) that specified climatic changes in the Pacific Basin were equally widespread; (2) that Pacific societies, regardless of their location throughout the vast and climatically varied Pacific Ocean, responded in similar ways; and (3) that periodic cooling of just a degree or two would have had a profound effect on tropical agricultural production. None of these assumptions appears sustainable in the face of evidence, and at this juncture, there do not appear to be any climatic

changes yet identified in the Pacific during the Holocene that would have had substantial consequences for Pacific societies in the time frames or ways proposed by Nunn and his colleagues.

Masse *et al.* (2006:128) noted that, ‘it cannot be assumed that the tropical Pacific is any less sensitive to the effects of rapid climate change than are more temperate climes’ but this is an arguable proposition in comparing agricultural sensitivity across the climatic zones, for example. They went on to say, ‘nor can it be assumed that every Pacific island group reacted with similar cultural responses to changing social and climatic conditions’ and this seems rather obviously true. As I have suggested here, the archaeological data from Palau do not support the Pacific-wide environmentally deterministic model proposed by Nunn *et al.* (2007) and in previous other papers on the subject (Nunn 2000, 2003a, 2003b, 2007). Although this one case does not preclude climate change around AD 1300 from possibly influencing societies elsewhere in the Pacific, it does throw into question the way in which archaeological data have been selected to fit a proposed model, versus testing a model using the broader spectrum of empirical data available. It may be that any societal changes occurring in the tropical Pacific around this time period were quite coincidental and had nothing to do with climatic change (which is why much of the archaeological data throughout the region appears to be contradictory). Given that our knowledge of climatic fluctuations in the Pacific is evolving rapidly, we should be hesitant to jump on Nunn’s ‘AD 1300 event’ bandwagon. Doing so runs the risk of ignoring other, and perhaps more parsimonious, explanations, especially those that involve social processes, but also those that may be demonstrably of other kinds of environmental origin.

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