Global Patterns of Early Village Development

Matthew Bandy

Abstract The discovery of a two-stage Neolithic Demographic Transition (NDT) has major implications for social evolutionary models of early village development. I explore these implications through a comparative study of 36 early village sequences. A strong relationship is evident between the timing of the formation of systems of autonomous villages and the rapid growth phase of the NDT. This relationship can be explained by a conflict model of village growth and fissioning during the NDT. Further, this kind of early village trajectory has a strong correlation with the process of primary state formation, and is therefore of utmost importance for global models of long-term social evolution.

Keywords Social evolution · scalar stress · village fissioning · village formation · chiefdom formation · state formation

It has been understood for over a century that the transition to agriculture was everywhere associated with a dramatic increase in human population levels. The rate and mechanism of this increase were intensively discussed in the 1970s and 1980s. By the standards of deep prehistory this is a reasonably well-understood problem. However, the recent research interest in the Neolithic Demographic Transition (NDT) has revealed an entirely new and unexpected dimension of the Neolithic demographic increase. This new dimension is the discovery that the NDT was, at least in many parts of the world, a two-stage process. An initial burst of very rapid population growth (stage 1) lasted for something less than a millennium, and was followed by a decline in the growth rate (stage 2) to levels consistent with our knowledge of preindustrial population growth. This two-stage structure was suggested in Bocquet-Appel's (2002) original publication on the subject, and was subsequently demonstrated in a more robust fashion, though with a smaller dataset, by myself (Bandy 2005; Fig. 1) using archaeological settlement data from North and South America. Archaeological settlement data can, in certain circumstances,

M. Bandy
SWCA Environmental Consultants, Broomfield, CO, USA
e-mail: matthew.bandy@gmail.com

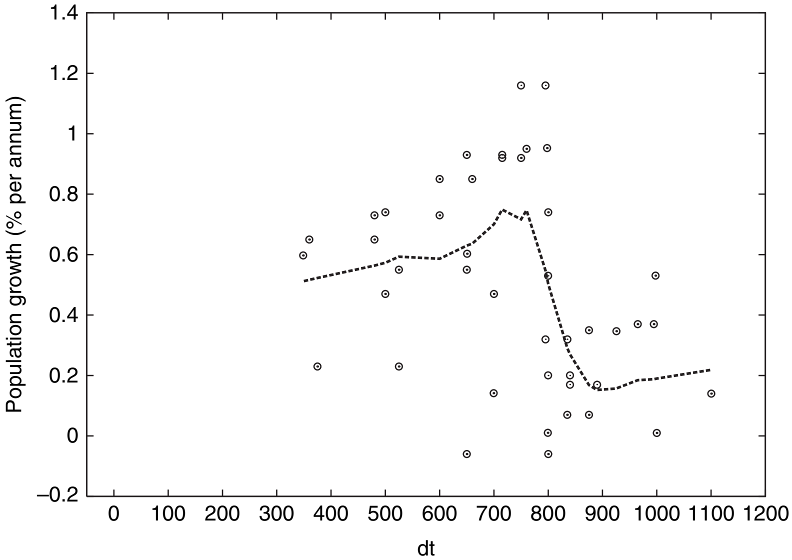

Fig. 1 Estimated population growth rates derived from regional archaeological settlement data relative to the transition to agriculture. Cases are the Valley of Mexico (Bandy 2005), Oaxaca (Bandy 2005), the southern Titicaca Basin (Bandy 2005), southwestern Colorado (Wilshusen 1999a, 1999b; Lipe and Varien 1999), and southern Ontario (Warrick 1990, 2000, 2006). The line was produced by the loess fitting function of the R statistical package

permit a better estimate of the rate of population growth than can cemetery data. The data presented in Fig. 1 indicate that during the NDT the rate of population growth ranged from approximately 0.5 to 1.0% annually, and that after the NDT the growth rate decreased to 0–0.2% annually.

Bocquet-Appel (2002) proposed that this two-stage structure of the NDT could be explained by a succession of demographic events. The initial surge in population growth could be explained by an increase in fertility, while the subsequent decline in the growth rate could be explained by a time-delayed increase in mortality, possibly related to increases in disease and parasite infestation in densely populated sites and regions. There are indeed some preliminary indications (Bocquet-Appel, Naji and Bandy 2008) that bioarchaeological disease indicators do increase with the second stage of the NDT rather than with the initial surge in population growth.

This two-stage structure of the NDT, then, is an entirely novel discovery with important implications for our understanding of the social and cultural transformations undergone by societies of the early agricultural periods of the various world regions. My goal in this chapter will be to present data demonstrating patterning in the global record of early agricultural societies that correlate with the timing of the two-stage NDT.

A Comparative Approach to Early Village Development

To assess the significance of the NDT for the development of early village societies, I undertook a comparative study of 36 archaeological early village sequences. This is an exercise in what Peregrine (2004) calls "archaoethnology," and has as its inspiration comparative studies of chiefdoms by Drennan (1991; Drennan and Peterson 2006) and others. Any study of this kind must choose between the breadth of the sample and the depth of the comparative analysis to be conducted. In this study, I have opted for the largest possible sample size in order to be able to detect patterns that might be related to the timing of the two-stage NDT. Accordingly, I recorded for each case in the sample only three pieces of information. The data are summarized in Table 1. The individual cases are discussed in more detail in an appendix.

1. The date of the transition to agriculture ($d\mathrm{t} = 0$). I should emphasize that the beginning of the NDT does not necessarily coincide with the beginning of food production in a region. Many parts of the world, and particularly many regions of the New World, have produced evidence of plant and/or animal domestication that precedes by a considerable interval any NDT-like demographic expansion. The transition to agriculture was therefore defined as the date at which relatively permanent agricultural village life appeared in a region.
2. The date at which large villages appeared in each sequence. Large villages are defined here as having an estimated population of at least 300 people and extending over a minimum of 3 ha. This threshold was suggested by my earlier work on village fissioning as significant in the development of complex forms of social organization (not necessarily hierarchical; see Bandy 2004). This did not occur in all sequences, and where it did it is not always possible to pinpoint the date at which it took place. The dates given in Table 1 represent my best estimates. In most cases I feel confident that the date I have given in within a few hundred years of the correct date.
3. The date at which primary state formation took place in each sequence. Obviously, this only took place in a very few of the cases under consideration. The importance of this date will become clear later in the discussion. Since all cases of primary state formation are relatively well studied, these dates could be ascertained with more confidence and precision than could the dates of the appearance of large villages.

The data on the date of large village formation, when displayed in years dt (the date of large village formation minus the date of the transition to agriculture), display a strongly bimodal distribution (Fig. 2). Zero on the graph represents the date of the agricultural transition in each sequence. The horizontal axis represents the time elapsed since the transition to agriculture (years dt), in 500-year increments. The vertical axis denotes the number of cases for which large village formation took place during the specified interval. The first mode therefore indicates a large number of cases in which large villages emerged within about 1000 years of the appearance of settled village life. The second mode represents a somewhat smaller number of

Table 1 Cross-cultural sample of early village sequences. Estimated dates are given for the agricultural transition (dt), the earliest appearance of large villages, and state formation. All dates are years C.E.

Location	*d*t	Large villages	State Formation	Type Region
Basin of Mexico	−1400	−650	−200	1 Mesoamerica
Central Henan, China	−6300	−5700	−1900	1 Asia
Cochabamba Valley, Bolivia	−1150	−100		1 South America
Henrietta focus, North Texas, USA	1100	1300		1 North America
Ica Valley, Peru	−500	50		1 South America
Indus Valley, Pakistan	−3800	−3500	−2600	1 Asia
Khartoum Neolithic, Sudan	−4900	−4350		1 Africa
Lake Sharpe, South Dakota, USA	1000	1150		1 North America
Mesopotamia	−6000	−5500	−3700	1 Near East
Moche Valley, Peru	−1800	−1550	200	1 South America
Inner Mongolia, China	−6200	−5400		1 Asia
Nile Valley, Egypt	−5200	−4800	−3100	1 Africa
Ontario Iroquois, Canada	600	1300		1 North America
Pajarito Plateau, New Mexico, USA	1150	1375		1 North America
Phoenix Basin, Arizona, USA	1	700		1 North America
Southern Levant	−9750	−8550		1 Near East
Southern Scandinavia	−3100	−2300		1 Europe
Southern Titicaca Basin, Bolivia	−1500	−500	300	1 South America
Southwest Colorado, USA	100	850		1 North America
Tuxtlas Mountains, Veracruz, Mexico	−1400	−700		1 Mesoamerica
Bac Bo, Vietnam	−2000	−250		2 Asia
Central Panama	−2000	500		2 Central America
Cucuteni-Tripolye, Ukraine	−6000	−3900		2 Europe
Cyprus	−8200	−4300		2 Europe

Table 1 (continued)

Location	*d*t	Large villages	State Formation	Type Region
Fúquene Valley, Colombia	−800	1200		2 South America
Negros Island, Phillipines	−1500	850		2 Asia
Northern Luzon, Phillipines	−1500	1000		2 Asia
Valley of Oaxaca, Mexico	−1500	−1000	−100	2 Mesoamerica
Olmec Heartland, Mexico	−1500	−1300		2 Mesoamerica
Southeast Poland	−5380	−3050		2 Europe
Southeast Spain	−5500	−2900		2 Europe
Thessaly, Greece	−7000	−4800		2 Europe
Valdivia Valley, Ecuador	−4400	−1400		2 South America
Highland New Guinea	−6000			4 Melanesia
Mimbres Valley, New Mexico, USA	200			4 North America
Wankarani, Oruro, Bolivia	−2000			4 South America

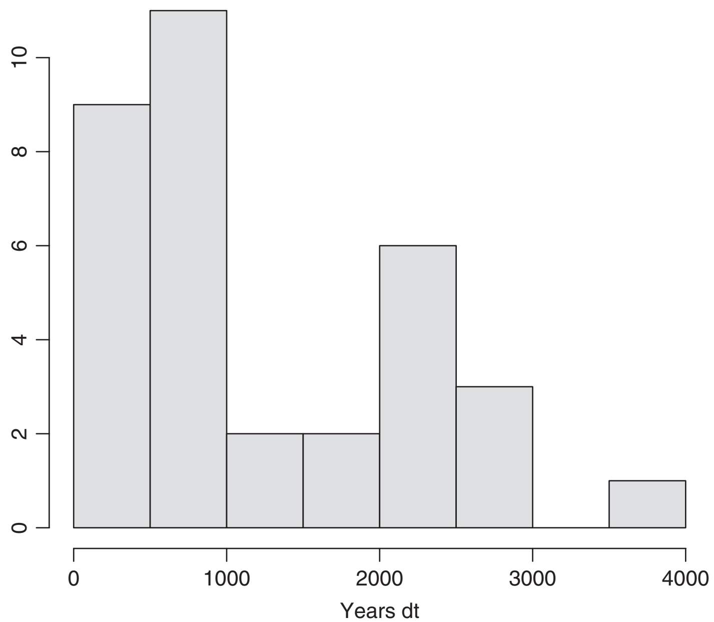

Fig. 2 The distribution of cases of large village formation in time relative to the agricultural transition

cases in which large villages emerged later, between 1500 and 2500 years after the transition to agriculture.

It is not immediately obvious how we are to interpret these modes. The patterning with respect to the date of the agricultural transition is clear, but the underlying processes are not. The situation may be considerably clarified if we classify the cases according to the manner in which the initial formation of large villages took place. I have divided the cases into four types with regard to the manner of large village formation.

1. In some sequences large villages emerge in the context of a system of more or less equivalent and autonomous villages. Large villages in these cases are simply first among equals, and a convex rank-size distribution is expected. In my sample, 20 cases may be classified as Type 1.
2. In some sequences large villages emerge initially as the capitals of small regional polities: as chiefdom centers (Drennan and Peterson 2006). In these cases the large villages are functionally distinct from their smaller contemporaries, serving as seats of political power, and a primate, primo-convex or even log-normal rank-size distribution is expected within the boundaries of the political unit. In my sample, 13 cases may be classified as Type 2.
3. In some cases, the first farmers of a region already live in large villages. This may be expected to occur when agriculture arrives in a region as a result of demic diffusion and the source region for the immigrants is already characterized by the presence of large villages. In this special case, therefore, the date of the agricultural transition and the date of the appearance of large villages are the same, large villages not having developed locally but arrived as part of the cultural package of a migrant group. In the sample under consideration no cases appear to fall into this category.
4. In many cases large villages, as defined here, simply never developed. The small number of Type 4 village sequences in the sample (3) does not reflect the rareness of the type in any representative cross-cultural sample; on the contrary, it reflects a research interest on my part in the process by which large villages develop. Type 4 sequences appear in fact to be extremely common in the world archaeological record, perhaps more common than all of the other types combined.

These four types of early village sequences will henceforth be referred to as Type 1, Type 2, Type 3 and Type 4 sequences. In the discussion to follow, Type 3 and 4 sequences will be largely excluded, effectively reducing the size of the sample to 33 cases.

When we plot Types 1 and 2 separately a clear pattern emerges (Fig. 3). The earlier of the two modes in the distribution is clearly composed primarily of Type 1 sequences, while the later mode is composed entirely of Type 2 sequences. The difference between the two types is even more pronounced when the data are displayed as a barplot (Fig. 4). The bimodal distribution of relative dates of large village formation therefore seems to reflect the existence of two entirely distinct pathways by which large, dense population centers are formed. Further, I shall argue that the

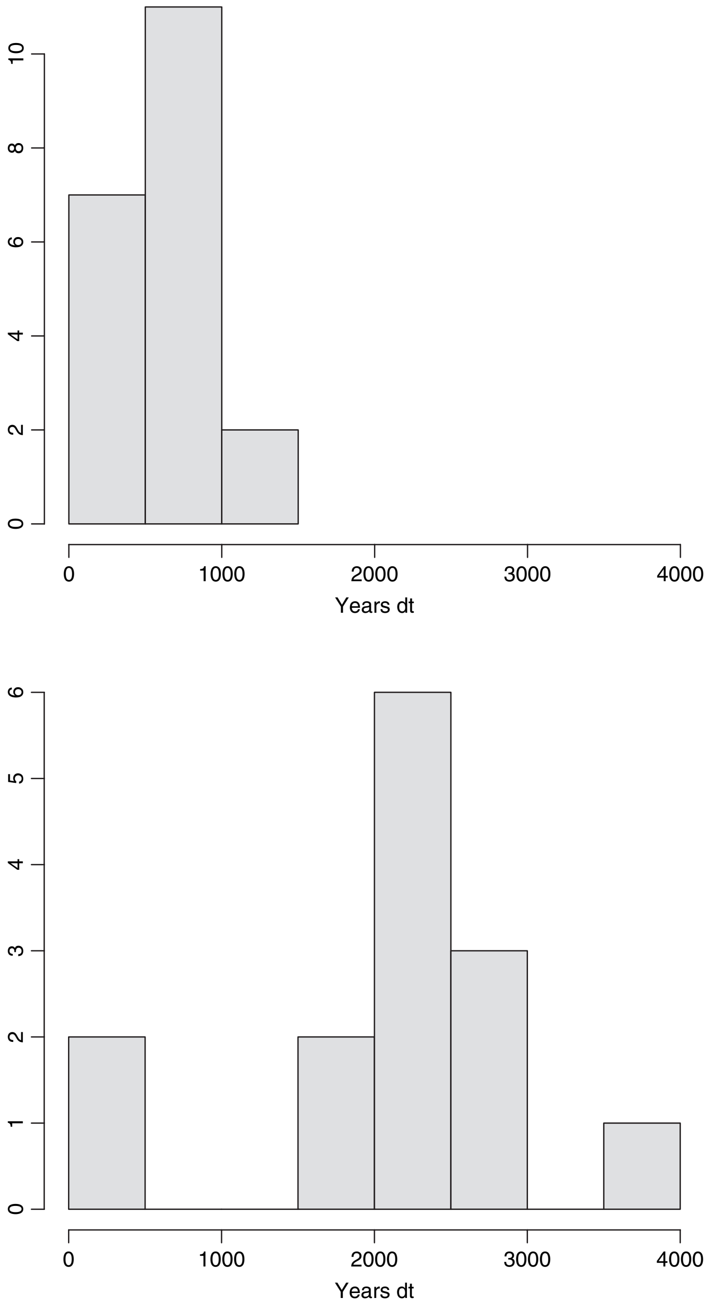

Fig. 3 Histogram showing the distribution of cases of large village formation in time relative to the agricultural transition by type. (**a**) Type 1 sequences, (**b**) Type 2 sequences

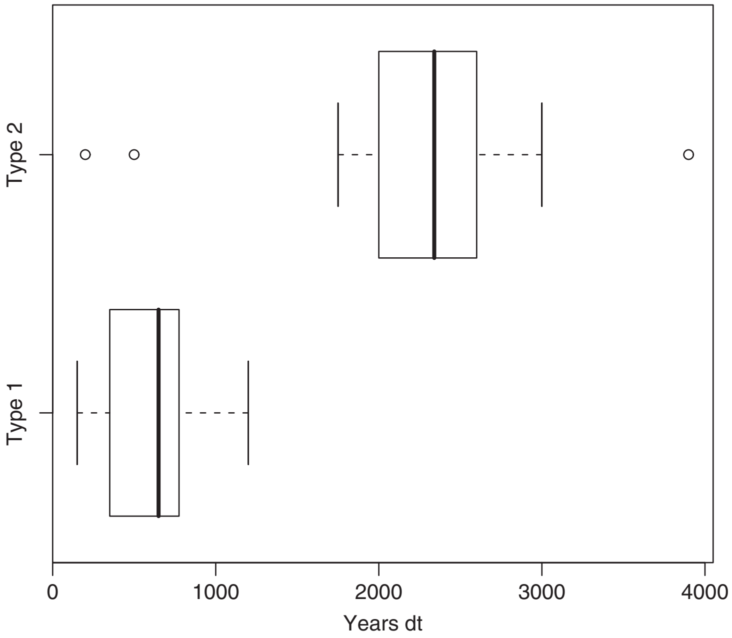

Fig. 4 Bar plot showing the distribution of cases of large village formation in time relative to the agricultural transition by type

differential distribution of the two pathways in relative time (*d*t) reflects a difference in their causal relationship to the rapid population growth of the NDT.

In the sample under consideration, large villages emerge in Type 1 sequences (as a system of autonomous, functionally equivalent villages) only within the first 1200 years following the transition to agriculture (median = 650 *d*t). The great majority of cases (18/20) see large villages appear in the first millennium. Recall that the period of very rapid population growth associated with the NDT has a duration of somewhat less than 1000 years following the beginning of agricultural village life (Bandy 2005). The coincidence between these two figures is remarkable and suggests that Type 1 village sequences are related in some causal way to this initial period of rapid growth.

Type 2 sequences display a complementary distribution in the relative chronology of the NDT. All but two cases (11/13) see large villages emerging (as chiefdom centers) more than 1700 years after the transition to agriculture (median = 2330 *d*t). Three outliers are evident on the boxplot (Fig. 4). On the long side is Cyprus, where apparently almost 4000 years passed between the transition to agriculture and the emergence of large villages. This may be an error, since there may have been an occupational hiatus on the island between the aceramic and ceramic Neolithic periods (see discussion in the appendix). If this was the case, then the transition to agriculture on Cyprus should be 5900 B.C.E., and only 1600 years would have passed before the first large villages appeared, in the Middle Chalcolithic (Steel 2004). This interval, though rather short, is still within the distribution of Type 2 sequences. The other two outliers are the Olmec Heartland and the Valley of Oaxaca. In both cases large villages appear as chiefdom centers very quickly following the transition to agriculture and easily within the expected rapid growth phase of the NDT. They emphasize the extremely precocious development of chiefdom organization in parts of Mesoamerica (see Drennan and Peterson 2006). This issue, however, though fascinating, cannot be addressed here. The important point is that in Type 2 sequences large villages almost always (excepting the Mesoamerican outliers) appear long after the NDT has passed and population growth has slowed. In contrast to the Type 1 sequences, Type 2 village formation is apparently not related to the NDT in any direct way.

A Model for Type 1 Village Formation

The precise manner in which the rapid population growth of the NDT is related to the emergence of autonomous village systems cannot, of course, be stated with certainty. However, I would like to propose the following hypothesis. Rapid population growth during the NDT presented a challenge to early village social organization. Growth in community size produced rapidly increasing levels of internal conflict in these villages. There is reason to believe that this conflict increased at a rate approximately proportional to the square of the village population (Carneiro 1987), and that a critical threshold of social stress was quickly reached. Upon reaching this threshold, village communities were presented with two options: (1) they could fission into two or more daughter communities, each smaller than the critical threshold size, or (2) they could develop some social mechanism that regulated and managed internal conflict in such a way as to make fissioning unnecessary. These conflict management mechanisms were frequently of a religious or ritual character (Adler and Wilshusen 1990; Bandy 2004), but we must imagine that the variety of possible solutions to the problem is as large as the variety of early village cultural diversity and historical experience. However, only the development of novel institutions of social integration at a suprahousehold level could make possible the emergence of villages larger than the critical population threshold, here provisionally defined as approximately 300 persons. I propose that Type 1 village sequences result from just such a process.

If the rate of increase of internal conflict within village communities is directly related to the rate of population growth, then we may conclude that the period of rapid population growth during the NDT was characterized by higher levels of social stress than the period either preceding or following it. Population doubling times during the NDT were on the order of 50–60 years, while after the NDT doubling times increased to something like 500 years. Therefore, after the NDT had passed and population growth rates had declined, there was a dramatic reduction in the kind of internal social conflict and stress that served as a spur to the development of effective mechanisms of social integration and conflict management. The kind of social evolutionary process I have described would be much more likely to have taken place during the NDT than either before or after it.

It is in this way that we can account for the temporal distribution of Type 1 village formation relative to the NDT. All Type 1 sequences in the sample resulted in systems of large, autonomous villages during or slightly after the period of the NDT and its associated rapid population growth. We may tentatively conclude, therefore, that systems of large, autonomous villages will only develop within a well-defined interval (less than 1500 years) following the onset of the NDT. The NDT therefore constitutes what might be called a window of evolutionary opportunity; after the NDT has passed, and the rate of population growth has decreased, Type 1 village formation becomes extremely unlikely.

Models for Type 2 Village Formation?

Type 2 sequences display a temporal distribution complementary to Type 1 sequences. With only two exceptions (both Mesoamerican) the initial emergence of large villages as chiefly centers took place more than 1500 years after the inception of agricultural village life, well beyond the period of rapid growth associated with the NDT. This distribution suggests that Type 2 sequences are unrelated to the NDT itself, and that the process by which chiefly centers emerge is entirely distinct from the model I have just outlined for Type 1 sequences. I will not attempt to formulate a model for this process, but will only suggest that chiefdom emergence may be related to higher overall regional population densities rather than to community size. The kinds of stresses, conflicts and interactions involved would therefore be expressed on a regional or macro-regional spatial scale rather than at the scale of the individual village community. Some Type 1 sequences did of course subsequently result in chiefdom centers, but my analysis suggests that the historical processes involved were of a different type. Though this chapter does not deal with chiefdom formation, it may be productive to delineate a typology of developmental trajectories of chiefdoms relative to the NDT, analogous to the approach taken here to early villages. Efforts in this direction have already been made, most notably by Drennan (1991; Drennan and Peterson 2006).

It is possible to suggest the outlines that such a typology might take. At least three types of chiefdom trajectories may provisionally be identified on the basis of the cases discussed in this chapter.

1. Regional polities that develop out of a system of autonomous villages; in other words, chiefdoms that develop subsequent to a Type 1 early village trajectory. Most of the known examples of primary state formation resulted from this kind of process.
2. Regional polities that develop very rapidly, during the period of the NDT, without being preceded by a system of autonomous villages. The two examples are the outliers of the Type 2 village sequence group: the Valley of Oaxaca and the Olmec Heartland. In both cases, large chiefdom centers developed very

quickly, during the period of the NDT. The processes driving these developments might be entirely different from those that drive the majority of Type 2 sequences.
3. Regional polities that develop according to the tempo of the majority of Type 2 sequences. Some of these developments, like the Philippine chiefdoms, can probably be explained by contact and interaction with expanding states. However, many examples had no contact with expansive states and this type of process can clearly occur autochthonously as well.

This very preliminary typology of chiefdom trajectories suggests that efforts to accommodate widely divergent historical trajectories into a single analytical framework of 'the chiefdom' are flawed. The patterned variability documented for archaeological chiefdom trajectories (Drennan and Peterson 2006) most likely reflects widely divergent evolutionary processes, as I have attempted to suggest in these brief notes. A multilinear approach to chiefdom evolution is called for.

The NDT and Long-Term Social Evolution

The postulation of a causal relationship between the rapid population growth of the NDT and the emergence of systems of large, autonomous villages has important implications that reach well beyond the analysis of early village societies themselves. Eight of the cases in my cross-cultural archaeological sample are primary state formation sequences. If we plot the timing of state formation in these cases relative to the NDT there is again a clear pattern (Fig. 5). In all but one of the cases (the exception is China) state formation took place between 1000 and 2500 years after the local onset of agricultural village life. It would seem therefore that after 2500 years have passed primary state formation becomes quite unlikely.

It is more informative, however, to consider the relative date of the emergence of large villages in cases that resulted in primary state formation (Fig. 6). In no primary state formation sequence did large villages emerge more than 1000 years after the onset of the NDT. This distribution is clearly identical to that of Type 1 village sequences as defined above, and indeed seven of the eight cases of primary state formation are characterized by Type 1 early village sequences (the exception is the Valley of Oaxaca).

This early emergence of large villages in all known primary state formation sequences is a fact of the utmost importance for our understanding of global patterns of social evolution. It suggests that the historical trajectories that result in primary state formation are precisely those in which large villages first appeared in the context of a regional system of autonomous villages; what I have termed Type 1 sequences. Those sequences in which large villages first emerged as chiefly centers (Type 2) are very unlikely to result in primary state formation.

In this chapter I hope to have demonstrated three things. First, that the NDT is one of the fundamental structuring processes of human history, and that consideration

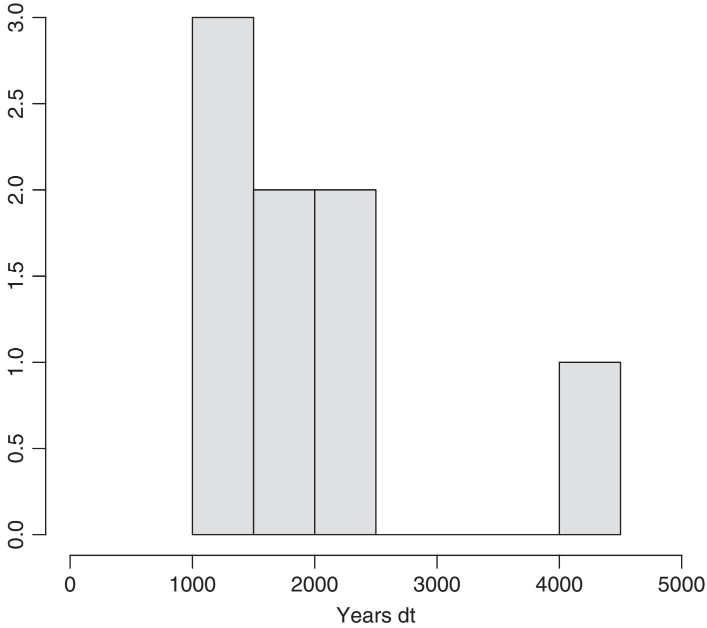

Fig. 5 The distribution of cases of primary state formation in time relative to the agricultural transition

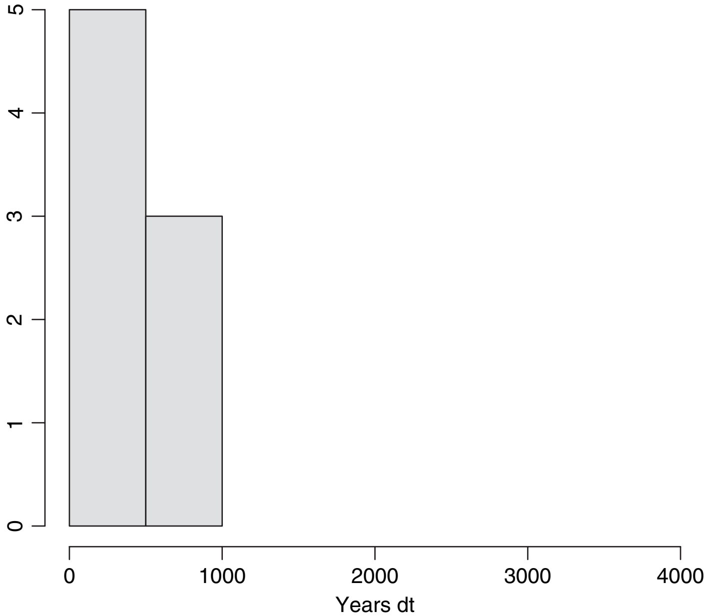

Fig. 6 The distribution of cases of large village formation in time relative to the agricultural transition. Only the eight primary state formation sequences are shown

of the economic, social, and cultural implications of the rapid growth phase of the NDT must be incorporated into any general account of long-term social evolution.

Second, that the two-stage structure of the NDT is of major significance in understanding the effect of the NDT on prehistoric societies and on long-term regional development. The divergent patterns of early village development that I have discussed in this chapter can only be understood by postulating that the evolutionary possibilities of societies experiencing the rapid growth of the NDT are different from those of societies growing at slower rates. Specifically, Type 1 village formation seems to be a possibility during the NDT, but very unlikely afterward.

Third, that the historical developments of the early village period have critical importance for an understanding of the later course of regional trajectories. Drennan has noted, in reference to divergent chiefdom trajectories, that "even the most spectacular differences in sequences of complex society development began to operate much earlier on in those sequences than we are accustomed to think" (1991:286). I make the same claim for early village trajectories. The particulars of early village development have a fundamental structuring significance for the later periods of a region's prehistory. The two-stage NDT as a regularity of early village development is important not only for the analysis of these societies themselves, but is essential for any adequate account of long-term social and cultural evolution at a global scale.

Appendix 1: Detailed Discussion of Cases

Basin of Mexico

Parsons (1974) places the agricultural transition at 1400 B.C.E. Large villages appear sometime during the First Intermediate I period (800–500 B.C.E.). Here I use the phase midpoint, or 650 B.C.E. Primary state formation takes place around 200 B.C.E., with the expansion of Cuicuilco and Teotihiacan.

Central Henan, China

Agriculture begins with the Cishan (Hebei) and Peiligang (Henan) cultures (Pearson and Underhill 1987) at around 6300 B.C.E. Pearson and Underhill (1987:807) state that these early villages are small: 1–2 ha, up to 200 people. For them, then, large villages developed later, in the Yangshao period (after 5100 B.C.E.). More recent sources, however (Liu 1996; Shelach 2000; Shih 1992; Yan 1999), consistently attribute large size to at least some of the earlier Cishan or Peligang villages. Shelach (2000:400), for example, suggests that the village of Cishan extended over 8 ha. Liu (1996:267) suggests that 6 ha might be an upper limit to Peiligang village size. Clearly, then, large villages appeared in pre-Yangshao times. Here I will use the midpoint of the Peiligang phase as given by Pearson and Underhill: 5700 B.C.E.

Primary state formation took place with the appearance of the Erlitou (Early Shang) culture (Pearson and Underhill 1987), at around 1900 B.C.E. (Liu 1996).

Cochabamba Valley, Bolivia

According to Higueras (1995:30) the Formative period in this valley on the Eastern slopes of the Andes dates from 1150 B.C.E to 200 C.E. The date of the agricultural transition would therefore be 1150 B.C.E. On the basis of his settlement survey, Higueras (1995:123) reports two large villages (5 and 7 ha) in the Mizque sub-valley during the Formative period. Large villages are therefore present late in the Formative period. The precise date is unknown. Here I will use 100 B.C.E. Primary state formation never took place in the Cochabamba Valley.

Henrietta focus, North Texas, USA

Most Early Plains Village sequences of the Southern Plains would be classified as Type 4 sequences; they never saw the development of large villages, at least not in the pre-contact period (Drass 1998). They are not included in Table 1 because a proliferation of Type 4 village sequences would have accomplished little in terms of the main interpretive conclusions of this study. The Henrietta Focus of the Upper Red River and Brazos River valleys of north Texas is, however, an exception (Drass 1998:434–438). The Henrietta Focus is poorly known, but village size appears to range from approximately 1 to 10 ha (Drass 1998:434). Assuming house densities are similar to those in the better-documented central Oklahoma phases (Paoli/Washita River), the sites on the large end of this range certainly would exceed 300 inhabitants.

The Henrietta complex seems to date from approximately 1100 to 1450 C.E., though it may be a bit earlier (See Drass 1998 for a discussion). I will here employ the midpoint of this time period, 1300 C.E., for the date of the appearance of large villages. The beginning of the Henrietta Focus (1100 C.E.) is used as the date of the agricultural transition. Primary state formation, of course, never took place in Texas.

Ica Valley, Peru

The transition to agriculture in the Ica Valley took place during the Early Horizon, at around 500 B.C.E. (Massey 1986). Villages on the threshold of my large village category (300 inhabitants) appear as early as the Early Horizon 2 (350–200 B.C.E.; Massey 1986:168, 173), but villages definitely in the large size range appear only in the Early Intermediate 1 (1–100 C.E.; Massey 1986:177). I use the midpoint date of the Early Intermediate 1, or 50 C.E. A chiefdom center (Cerro Tortolita) definitely appears during Early Intermediate 3–4 (200–300 C.E.; Massey 1986:188). This is therefore a Type 1 sequence with large villages by 50 C.E. and chiefdom formation taking place some centuries later. Primary state formation did not take place in the Ica Valley

Indus Valley, Pakistan

According to McIntosh (2002:45) farmers arrived in the Indus Valley proper in “later 4th millennium” B.C.E. from Baluchistan. Possehl (2002) gives a somewhat earlier date for the transition to agriculture, in his Phase II or Hakra Wares phase, dating to 3800–3200 B.C.E. Villages during this phase were already large, averaging greater than 6 ha in extent (Possehl 2002:34), and state formation (or urbanism at least; he prefers not to say that these are "states") took place around 2600 BC.

There are, then, two possibilities. In the first, the earliest farmers of the Indus Valley were immigrants from Baluchistan who already, at the time of colonization, lived in large villages; in other words, that this is a Type 3 sequence. The other is that this is a Type 1 sequence and that large villages developed rapidly sometime during the Hakra Wares phase, around 3500 B.C.E. In this chapter, I have assumed the latter scenario to be valid.

Khartoum Neolithic, Sudan

The Khartoum Neolithic dates from 6000 to 5000 BP, uncalibrated, and by the end of this period large sites were present along the Nile, up to approximately 4 ha and 2 m or more in depth (Mohammed-Ali 1987:128). These would appear to qualify as large villages according to my criteria, though they are not well understood. Large villages therefore appeared sometime during the date range provided by Mohammed-Ali: in the mid-fifth millennium. It certainly took less than 1000 years for these large sites to develop, and perhaps considerably less. I cannot evaluate this question here. I will use 6000 BP as the date of the agricultural transition, and 5500 BP as the date of the development of large villages. These calibrate to approximately 4900 and 4350 B.C.E., respectively.

Lake Sharpe, South Dakota, USA

Agricultural villages appear in the Initial variant of the Coalescent Tradition, around 1000 C.E. (Toom 1992:133). Village sizes are 3.22 ± 2.41 ha, with maximum size of 11 ha (with an estimated 100 houses) and numerous villages in the 7 ha range. These large sites appear during the Initial Middle Missouri Variant, or 1000–1300 C.E. (Toom 1992:144–145). The 11 ha site (the early occupation of the Summors site) is estimated to have had 1000 inhabitants (Toom 1992:148). This clearly qualifies as a large village. There is no evidence of stratified social structure or regional political integration. The date of large village formation will be taken as the phase midpoint, or 1150 C.E.

Mesopotamia

State formation takes place at around 3700 B.C.E., at the beginning of Uruk period (Wright 1977:386). Agriculture arrived in Akkad (northern Mesopotamia) at around 6000 B.C.E., and large villages emerged in the Halafian, beginning around 5500 B.C.E. Villages of the earlier Hassuna culture remained small, between 100 and 200 inhabitants (Knapp 1988:24).

Moche Valley, Peru

Agriculture begins in the Moche Valley in the Early Guanape phase, around 1800 B.C.E. (Billman 1996). In Early Guanape there is already temple architecture, and a large village (Gramalote, 2 ha, around 100–200 habitations, possibly as many as 500–1000 people; Billman 1996:137). So large villages appear at the midpoint of the Early Guanape phase, around 1550

B.C.E. State formation took place early in the Moche phase (ca. 200 C.E.) when the Cerro Oreja polity forced highland colonists out of the coca lands in the Middle Valley (Billman 1996:290).

Inner Mongolia

Agriculture appears at the beginning of the Xinglongwa phase, around 6200 B.C.E. (Shelach 2000). Large villages begin in the Zhaobaugou period (5400–4500 B.C.E.). The beginning date of the Zhaobaugou period, 5400 B.C.E., is used here for the date of the appearance of large villages.

Nile Valley, Egypt

According to Knapp (1988), the agricultural transition in Egypt took place around 5000 B.C.E., large villages appeared sometime during the Amratian, probably around 4500 B.C.E., and state formation took place at 3100 B.C.E., or perhaps slightly earlier. Phillipson (2005:187) gives slightly different though broadly congruent dates: an abrupt agricultural transition in the lower Nile Valley around 5200 B.C.E., and a large village (Merimde, in the Nile delta, covered about 18 ha) by 4800 B.C.E. Here I employ the dates from Phillipson.

Ontario Iroquois, Canada

Maize agriculture began in Ontario with the Princess Point complex, approximately 600–900 C.E. (Warrick 2006). Princess Point sites contain maize and material culture considered to be "directly ancestral to Early Iroquoian sites in Ontario" (Warrick 2000:427). Average Princess Point village population was about 75 people, with a maximum size of about 200 inhabitants, and villages were occupied for 40–50 years (Warrick 2000:430–431). Villages remained small through the Early Iroquoian period (Warrick 2000:438), with large villages, of 400–500 inhabitants, first appearing in the Uren phase (1300–1330 C.E.; Warrick 2000:440).

Pajarito Plateau, New Mexico, USA

The first farmers in this area appeared very late, around 1150 C.E., and were probably immigrants from the San Juan Basin (Kohler and Root 2004a). These early sites were quite small, with less than 20 rooms per site (Kohler and Root 2004a:123 and Table 4.1). Sites were larger in the Late Coalition and Earliest Classic, but remained below the 300 inhabitant threshold used in this study (Kohler and Root 2004b:216). By the Middle Classic (1400s C.E.) there were seven major towns, spaced about 5 km apart (Kohler et al. 2004:216). At least one village, Tyuonyi, had an estimated 400 rooms and certainly was home to more than 300 inhabitants (Kohler et al. 2004:236). The date for the appearance of large villages used here will be 1375 C.E.

Phoenix Basin, Arizona, USA

Agricultural villages appeared in the Phoenix Basin at the end of the Red Mountain phase; around 1 C.E. (Ciolek-Torello 1998). Wallace (2003a:22) sees the agricultural transition as taking place slightly later in Phoenix, around 150 C.E. Ciolek-Torello's date is employed here. Villages of more than 300 inhabitants appear in the Phoenix Basin by 700 C.E., the Snaketown phase (Craig 2000). Incidentally, large villages seem to have appeared much later if at all in the nearby Tucson Basin (Wallace 2003b; Wallace and Lindeman 2003), though agriculture appears much earlier (Ciolek-Torello 1998). Tucson may be a Type 4 sequence.

Southern Levant

The transition to agriculture took place at the beginning of the Pre-Pottery Neolithic A (PPNA) period, which Kuijt and Goring-Morris (2002) place at 9750 B.C.E. According to Hole (2000:194) villages remain small in the PPNA, ranging from 0.1 to 2.5 ha, with perhaps a few hundred inhabitants. Much larger villages appear in the PPNB, including Abu Hureyra (11.5 ha; Hole 2000:198) and 'Ain Ghazal (12–13 ha; Hole 2000:202–203). These very large villages are rather late, however. The largest sites in the Middle PPNB are in the 4.5–5.0 ha range (Kuijt 2000:80), certainly large villages according to the criteria employed here. Data on the Early PPNB are rather vague, but it would appear that large villages first appeared during the period. Kuijt and Goring-Morris (2002) place the beginning of the Early PPNB at around 8550 B.C.E. This date will be used for the appearance of large villages. Primary state formation never took place in the Levant.

Southern Scandinavia

Herding appears at the beginning of the TRB, about 3100 B.C.E. However, sites that might be called 'villages' appear later, around 2600 B.C.E., and hunting appears to decline in importance (Price and Gebauer 1992). The earlier date will be used for the agricultural transition in this study; however, an argument could be made that the later date would be more appropriate. Large villages of 7–30 ha, at least some of which are certainly large villages by the criteria employed here, appear sometime in the Late Funnel Beaker period (2450–2200 B.C.E.; Price and Gebauer 1992:101). The midpoint of this range (2300 B.C.E.) will be used here for the date of the appearance of large villages.

Southern Titicaca Basin, Bolivia

The agricultural transition took place at the beginning of the Early Chiripa phase (1500–1000 B.C.E.), at 1500 B.C.E. (Bandy 2001, 2006). Villages remained small through the Early and Middle Chiripa (1000–800 B.C.E.) phases, only achieving more than 300 estimated inhabitants after 800 B.C.E. during the Late Chiripa phase. The date employed here will be the midpoint date for the Late Chiripa phase, about 500 B.C.E.

Southwest Colorado, USA

The agricultural transition in southwestern Colorado begins around 100 C.E. during the Basketmaker II period (Bandy and Wilshusen in prep). Large villages appear in the Pueblo I period (750–900 C.E.), by no later than 850 C.E. (Wilshusen and Ortman 1999).

Tuxtlas Mountains, Veracruz, Mexico

Occupation begins in the Early Formative at 1400 B.C.E. with two clusters of small villages (Santley and Arnold 1996:228). Large villages appear in the Middle Formative (1000–400 B.C.E.; Santley and Arnold 1996:228). The date used here will be the midpoint of that range: 700 B.C.E. Santley and Arnold (1996:231) maintain that no regional polity yet existed at this time (this appeared later, in the Late Formative) and that these villages were basically egalitarian. This is therefore a Type 1 sequence.

Bac Bo, Vietnam

This is the lower course of the Red River in northern Vietnam. The general region is called Bac Bo by Higham (2002, 2004). The Neolithic begins around 2000 B.C.E. with the Phung Nguyen culture, though it could begin earlier. Villages are in the range of 1–3 ha (Higham 2004:88). The site of Dong Dau is a 3-ha mound (Higham 2004:151) first occupied in the Phung Nguyen phase, and occupied into the Bronze Age. In the Bronze Age (beginning around 1500 B.C.E.) there are two phases: Dong Dau and Go Mun. Go Mun dates to 1000–500 B.C.E. (Higham 2004:175). Go Mun sites apparently remain in the 1–3 ha range. It is not until the Iron Age Dong Son culture, beginning around 500 B.C.E., that large settlements appear (Higham 2004:170–179). Higham singles out Co Loa for mention, a massive walled site covering as much as 600 ha (Higham 2004:172). The urban occupation of Co Loa began in the "third century BC" (Higham 2004:172). I will therefore use the date 250 B.C.E. for the first appearance of large villages in Bac Bo, though I recognize that this could be off by as much as 300 years.

Bellwood (1997) and Nguyen et al. (2004) date the beginning of the northern Vietnamese Neolithic to much earlier, as early as 5000 B.C.E. This would, however, simply expand the time elapsed between the transition to agriculture and the appearance of large villages. The interval I have given here – 1750 years, using Higham's dates – is therefore an absolute minimum.

Central Panama

Drennan (1991:273) suggests that agricultural villages, such as La Mula-Sarigua, existed by 2000 B.C.E. However, in all early periods these settlements seem to have been characterized by very low residential density. Linares and Sheets suggest a rule of thumb (for Volán Barú) of one household/ha. If this is so, then Sitio Sierra, covering 45 ha at about 200 B.C.E. (Drennan 1991:274) probably had less than 300 inhabitants and does not qualify as a large village. After 500 C.E., larger settlements are in evidence (Drennan 1991:274) associated with the Coclé art style, most famously at Sitio Conte (500–900 C.E.). I will therefore use 500 C.E. for the first appearance of large villages.

Cucuteni-Tripolye, Ukraine

Agriculture appears around 6000 B.C.E. at the beginning of the Early Neolithic Bug-Dnestr culture (Milisauskas 2002:153). The Cucuteni-Tripolye culture begins at 5000 B.C.E. in the Middle Neolithic (Milisauskas and Kruk 2002:194). Large villages appear "after 4000 BC" (Milisauskas and Kruk 2002:217–221), in the middle and late phases of the Cucuteni-Tripolye culture. I will here use the date 3800 B.C.E. Some of these later villages are enormous, with sizes in excess of 200 ha and possibly 10,000 inhabitants or more.

Cyprus

Cyprus was initially colonized in the early aceramic Neolithic, ca 9000 BP (Mylouthkia and Shillourokambos; Steel 2004:34–35). The late aceramic Neolithic continues through 7000 BP and has no large villages, though sites are densely occupied. There is an apparent gap of 500–1000 years in the existing radiocarbon dates for the island between the end of the aceramic and the beginning of the ceramic Neolithic periods (Steel 2004:63). Steel believes that this represents an occupational hiatus. The ceramic Neolithic appears around 6000 BP, and is characterized by small villages (0.5–1.5 ha; Steel 2004:67). Large villages appear in Middle Chalcolithic (5500–4500 BP; Steel 2004:86). The largest, Mosphilia, extends over 10 ha; nearby villages cover 3 and 6 ha. This is a hierarchical organization, and therefore a Type 2 sequence. Calibration of Steel's BP dates produces 8200 B.C.E. for the transition to agriculture and 4300 B.C.E. for the appearance of large villages.

The possibility of abandonment and recolonization of the island is a critical issue, since it makes the difference between a long (3900 year) and a much shorter (1600 + years) gap between the agricultural transition and the appearance of large villages. I here assume that occupation was continuous, though I recognize this to be problematic.

Fúquene Valley, Colombia

Agriculture begins here at the beginning of the Herrerra Period (800 B.C.E.–800 C.E.; Langebaek Rueda 1995). Sites are small, with no evidence of nucleated habitation (Langebaek Rueda 1993:138). In the Early Muisca Period (800–1200 C.E.) there is some aggregation into villages as opposed to dispersed farmsteads, but maximum village size still remains quite low. The largest is only 3.15 ha (Langebaek Rueda 1993:162). No large villages are present, and the system has a convex rank-size distribution (Langebaek Rueda 1993:166). In the Late Muisca Period (1200–1600 C.E.) chiefly centers are clearly present. The largest site (VF320) is larger than 20 ha, and probably had more than 300 inhabitants. The beginning date of the Late Muisca Period (1200 C.E.) is used here for the first appearance of large villages.

Negros Island, Phillipines

According to Bacus (2004:261) a Neolithic lifeway begins in the Phillipine archipelago with the small open air village site of Andarayan at around 1500 B.C.E. Though few villages are known for the period prior to 500 C.E., those that are known are small, such as the 1 ha site of Unto (Bacus 2004:266). I will assume that larger sites would be known if they existed. Large villages emerge as chiefly centers throughout the Phillipines during the Porcelain Period (500–1000 C.E.), coincident with the expansion of Chinese maritime trade in the Tang dynasty and the closure of overland Silk Road route (Bacus

2004:266–267). On Negros, the chiefly center of Yap emerges sometime in the eleventh century (Bacus 2004:275). The date used here will be 1000 C.E.

Northern Luzon, Phillipines

For the beginning of agriculture in the Phillipines, see the discussion of Negros Island, above. I will use Bacus's date of 1500 B.C.E. The earliest large village on northern Luzon mentioned by Bacus is located in the vicinity of Manila, and dates to "at least the eleventh century" (Bacus 2004:270). I will use the midpoint for the Porcelain Period – 850 C.E. – though I recognize that this is very approximate.

Bellwood (1997:219), citing the Dimolit site, prefers a much earlier date of "perhaps 2500 BC" for the beginning of the Neolithic in northern Luzon. I will use Bacus's date as a minimum. Adopting Bellwood's date would produce a longer interval between the agricultural transition and the appearance of large villages: 3350 as opposed to 2350 years.

Valley of Oaxaca, Mexico

The transition to agriculture took place in Oaxaca around 1500 B.C.E. (Kowalewski et al. 1989). The site of San Jose Mogote emerges as a chiefly center and large village sometime during the San Jose phase. The midpoint of the San Jose phase (1000 B.C.E.) will be employed here as the date of the appearance of large villages. Primary state formation takes place in Oaxaca at least by 100 B.C.E.

Olmec Heartland, Mexico

Agriculture begins around 1500 B.C.E. in the Olmec Heartland, as in much of Mesoamerica. According to Drennan (1991:264) San Lorenzo emerges as a chiefdom center and large village during the Bajío phase (1350–1250 B.C.E.). The phase midpoint – 1300 B.C.E. – will be used here.

Southeast Poland

Agriculture appears at the beginning of the LBK, locally 5380 B.C.E. (Milisauskas and Kruk 1993:65). Large villages appear as chiefly centers in the Baden period (3050 B.C.E.; Milisauskas and Kruk 1993:88); The largest site at this time is 18 ha. It is possible that a large village existed somewhat earlier, in the Funnel Beaker period. The largest site at this time was about 8 ha, but sites in this region have very low residential density (Milisauskas and Kruk 1993:88) and it is far from certain that this site had more than 300 inhabitants.

Southeast Spain

According to Gilman and Antonio (2001:61–64), there are no large villages in the Neolithic, Copper, or Bronze ages of Spain. Los Millares is the only exception, extending over approximately 5 ha. The Millaran copper age dates from 3500 to 2250 B.C.E. As Gilman notes, we cannot be sure to what part of this period the large occupation of Los Millares dates. I will employ the phase midpoint: 2900 B.C.E. Los Millares clearly represents some kind of regional capital, and is here interpreted as a chiefdom center and a Type 2 sequence. Chapman (1990:150) notes another large site, El Malagón, which he suggests may have had a population of about 1500, and covered perhaps

7.5 ha. He also suggests that Los Millares had a population of 1000. The Cardial Neolithic in southeast Spain begins at about 5500 B.C.E.

Thessaly, Greece

The Neolithic begins in Thessaly around 7000 B.C.E. (van Andel and Runnels 1995:497) with the arrival of colonists from Anatolia. According to Demoule and Perlés (1993:368–369; Perlés 2001:176–180) Early Neolithic (7000–6000 B.C.E.) and Middle Neolithic (6000–5500 B.C.E.) villages are small, in the 100–300 person range, though the estimation of village population remains a vexing problem. Tells continue in Thessaly during the Late Neolithic (Demoule and Perlés 1993:388), but apparently in Phase 4 (later Late Neolithic, or Late Neolithic II, around 4800–4500 B.C.E.) small hamlets are abandoned and population is concentrated into larger sites. It is at this point that large villages like Dimini emerge, probably as chiefly centers. Late Neolithic Dimini has a large "megaron" (a public structure, possibly a temple or elite residence) and is surrounded by fortification walls. I will employ 4800 B.C.E. as the date for the appearance of large villages in Thessaly.

Valdivia Valley, Ecuador

Agriculture and settled village life appear in the Early Valdivia phase, beginning around 4400 B.C.E. (Zeidler 2003; see also Marcos and Michczynski 1996). These are, of course, the earliest known farming villages in the New World. Early Valdivia villages in general are estimated to have had 150–200 inhabitants (Damp 1984a:582). In the Valdivia Valley, large villages are not present in the Early, Middle, or Late Valdivia periods (Schwarz and Raymond 1996). Large, nucleated villages of 3–6 ha emerged only in the following Machalilla phase, after 1400 B.C.E. (Schwarz and Raymond 1996:216). These appear to be the centers of small polities and therefore are interpreted as chiefly centers. This is a Type 2 sequence. It should be noted that this reconstruction applies only to the Valdivia Valley itself. Other nearby valleys, such as the Chanduy Valley, probably have a different settlement history, with large sites like Real Alto emerging much earlier in Early Valdivia (Damp 1984a). Unfortunately, no systematic data are available for their settlement systems.

Mimbres Valley, New Mexico, USA

Agriculture appears in the Early Pithouse Period (200–550 C.E.; Blake et al. 1986). Early and Late Pithouse Period (550–1000 C.E.) villages remain small, with a maximum population in the low hundreds (Blake et al. 1986:459). In the Classic Period (1000–1150 C.E.) aggregated pueblos appear, but none of these are larger than about 200 rooms, and therefore would have fewer than 200 inhabitants (Blake et al. 1986:460). Villages remained small in the following Black Mountain (1150–1300 C.E.) and Cliff (1300–1450 C.E.) phases, and thereafter. This is a Type 4 sequence. Large villages never appeared.

Wankarani, Oruro, Bolivia

Agriculture and villages begin together at around 2000 B.C.E. Large villages never appeared (McAndrews 2005). This is therefore a Type 4 sequence.

References

Adler, Michael A. and Richard H.Wilshusen 1990. Large-Scale Integrative Facilities in Tribal Societies: Cross-Cultural and Southwestern US examples. *World Archaeology* 22(2):133–146.

Bacus, Elizabeth. 2004. The Archaeology of the Phillipine Archipelago. In Ian Glover and Peter Bellwood, eds., *Southeast Asia: From Prehistory to History*, pp. 257–281. RoutledgeCurzon, New York.

Bandy, Matthew S. 2004. Fissioning, Scalar Stress, and Social Evolution in Early Village Societies. *American Anthropologist* 106(2):322–333.

Bandy, Matthew S. 2001. Population and History in the Ancient Titicaca Basin. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Berkeley.

Bandy, Matthew S. 2005. New World Settlement Evidence for a Two-Stage Neolithic Demographic Transition. *Current Anthropology* 46(S):S109–S115.

Bandy, Matthew S. 2006. Early Village Society in the Formative Period of the Southern Lake Titicaca Basin. In William H. Isbell and Helaine Silverman, eds., *Andean Archaeology III: North and South*, pp. 210–236. Springer, New York.

Bellwood, Peter. 1997. *Prehistory of the Indo-Malaysian Archipelago*, revised edition. University of Hawai'i Press, Honolulu.

Billman, Brian R. 1996. The Evolution of Prehistoric Political Organization in the Moche Valley, Peru. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Santa Barbara.

Blake, Michael, Steven A. LeBlanc, and Paul E. Minnis. 1986. Changing Settlement and Population in the Mimbres Valley, SW New Mexico. *Journal of Field Archaeology* 13(4):439–464.

Bocquet-Appel, Jean-Pierre. 2002. Paleoanthropological Traces of a Neolithic Demographic Transition. *Current Anthropology* 43:637–650.

Bocquet-Appel, Jean-Pierre and Stephan Naji. 2006. Testing the Hypothesis of a Worldwide Neolithic Demographic Transition: Corroboration from American Cemeteries. *Current Anthropology* 47:341–65.

Bocquet-Appel, Jean-Pierre, Stephan Naji, and Matthew S. Bandy. In press. Demographic and Health Changes During the Transition to Agriculture in North America. In Jean-Pierre Bocquet-Appel, ed., *Recent Advances in Paleodemography: Data Techniques, Patterns*. New York: Springer.

Carneiro, Robert. 1987. Village Splitting as a Function of Population Size. In L. Donald, ed., *Themes in Ethnology and Culture History: Essays in Honor of David F. Aberle*, pp. 94–124. Folklore Institute. Archana Publications. Meerut, India.

Chapman, Robert. 1990. *Emerging Complexity: The Later Prehistory of South-East Spain and the West Mediterranean*. Cambridge University Press, Cambridge.

Ciolek-Torello, Richard. 1998. Sites of the Early Formative Period. In Richard Ciolek-Torello, ed., *Early farmers of the Sonoran Desert: Archaeological Investigations at the Houghton Road Site, Tucson, Arizona*, pp. 229–256. Technical Series 72. Statistical Research, Inc., Tucson.

Craig, Douglas B. 2000. The Demographic Implications of Architectural Change at the Grewe Site. In David E. Doyel, Suzanne K. Fish and Paul R. Fish, eds., *The Hohokam Village Revisited*, pp. 139–166. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science.

Damp, Jonathan E. 1984a. The Architecture of the Early Valdivia Village. *American Antiquity* 49(3):573–585.

Demoule, Jean-Paul and Catherine Perlés. 1993. The Greek Neolithic: A New Review. *Journal of World Prehistory* 7(4):355–416.

Drass, Richard. 1998. The Southern Plains Villagers. In W. Raymond Wood, ed., *Archaeology of the Great Plains*, pp. 415–455. University Press of Kansas, Lawrence.

Drennan, Robert D. 1991. Pre-hispanic Chiefdom Trajectories in Mesoamerica, Central America, and Northern South America. In Timothy Earle, ed., *Chiefdoms: Power, Economy, and Ideology*, pp. 263–287. Cambridge University Press, Cambridge.

Drennan, Robert D. and Christian E. Peterson. 2006. Patterned Variation in Prehistoric Chiefdoms. *Proceedings of the National Academy of Sciences* 103(11):3960–3967.

Gilman, Antonio. 2001. Assessing Political Development in Copper and Bronze Age Southeast Spain. In Jonathan Haas, ed., *From Leaders to Rulers*, pp. 59–84. Kluwer/Plenum, New York.

Higham, Charles. 2002. *Early Cultures of Mainland Southeast Asia*. Art Media Resources, Chicago.

Higham, Charles. 2004. Mainland Southeast Asia from the Neolithic to the Bronze Age. In Ian Glover and Peter Bellwood, eds., *Southeast Asia: From Prehistory to History*, pp. 41–67. RoutledgeCurzon, New York.

Higueras, Alvaro. 1995. *Settlement Development in the Cochabamba Valley: Human-Lands Relationships from the Formative to the Intermediate Period Occupations*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Pittsburgh.

Hole, Frank. 2000. Is Size Important? Function and Hierarchy in Neolithic Settlements. In Ian Kuijt, ed., *Life in Neolithic Farming Communities*, pp. 191–210. Kluwer/Plenum, New York.

Knapp, Bernard. 1988. *The History and Cultures of Ancient Western Asia and Egypt*. Wadsworth, London.

Kohler, Timothy A. and Matthew J. Root. 2004a. The First Hunter-Farmers on the Pajarito Plateau. In Timothy A. Kohler, ed., *Archaeology of Bandelier National Monument: Village Formation on the Pajarito Plateau, New Mexico*, pp. 117–172. University of New Mexico Press, Albuquerque.

Kohler, Timothy A. and Matthew J. Root. 2004b. The Late Coalition and Earliest Classic on the Pajarito Plateau. In Timothy A. Kohler, ed., *Archaeology of Bandelier National Monument: Village Formation on the Pajarito Plateau, New Mexico*, pp. 173–213. University of New Mexico Press, Albuquerque.

Kohler, Timothy A., Sarah Herr, and Matthew J. Root. 2004. The rise and fall of towns on the Pajarito. In Timothy A. Kohler, ed., *Archaeology of Bandelier National Monument: Village Formation on the Pajarito Plateau, New Mexico*, pp. 215–264. University of New Mexico Press, Albuquerque.

Kowalewski, Steven A., Gary M. Feinman, Laura Finsten, Richard E. Blanton, and Linda M. Nicholas. 1989. *Monte Albán's Hinterland. Pt. 2. Prehispanic settlement patterns in Tlacolula, Etla, and Ocotlan, the Valley of Oaxaca, Mexico*. Memoirs of the Museum of Anthropology, University of Michigan, 23.

Kuijt, Ian. 2000. People and Space in Early Agricultural Villages: Exploring Daily Lives, Community Size, and Architecture in the Late Pre-Pottery Neolithic. *Journal of Anthropological Archaeology* 19:75–102.

Kuijt, Ian and Nigel Goring-Morris. 2002. Foraging, Farming, and Social Complexity in the Pre-Pottery Neolithic of the Southern Levant: A Review and Synthesis. *Journal of World Prehistory* 16(4):361–440.

Langebaek Rueda, Carl Henrik. 1993. *From Hunters and Gatherers to Muiscas, Campesinos, and Hacendados in the Eastern Highlands of Colombia: Archaeological Survey in the Valles de Fúquene and Susa*. Unpublished Ph.D. dissertation. Department of Anthropology, University of Pittsburgh.

Langebaek Rueda, Carl Henrik. 1995. *Regional Archaeology in the Muisca Territory: A Study of the Fúquene and Susa Valleys*. University of Pittsburgh Memoirs in Latin American Archaeology, No. 9.

Lipe, William D. and Mark D. Varien. 1999. Pueblo II (A.D. 900–1100). In William D. Lipe, Mark D. Varien, and Richard H. Wilshusen, eds., *Colorado Prehistory: A Context for the Southern Colorado River Basin*, pp. 242–301. Eagle: Colorado Council of Professional Archaeologists.

Liu, Li. 1996. Settlement Patterns, Chiefdom Variability, and the Development of Early States in North China. *Journal of Anthropological Archaeology* 15:237–288.

Marcos, Jorge G. and Adam Michczynski. 1996. Good Dates and Bad Dates in Ecuador: Radiocarbon Samples and Archaeological Excavation: A Commentary Based on the "Valdivia Absolute Chronology." In *Andes: Boletín de la Misión Arqueológica Andina* 1: 93–114. Warsaw.

Massey, Sarah. 1986. *Sociopolitical Change in the Upper Ica Valley, BC 400 to 400 AD: Regional States on the South Coastof Peru*. Unpublished ph.d. dissertation, Department of Anthropology, University of California, Los Angeles.

McAndrews, Timothy. 2005. *Wankarani settlement systems in evolutionary perspective: A study in early village-based society and long-term cultural evolution in the south-central Andean Altiplano*. University of Pittsburgh Memoirs in Latin American Archaeology, No. 15.

McIntosh, Jane R. 2002. *A Peaceful Realm: The Rise and Fall of the Indus Civilization*. Westview Press, Boulder.

Milisauskas, Sarunas. 2002. Early Neolithic, the First Farmers in Europe. In Sarunas Milisauskas, ed., *European Prehistory: A Survey*, pp. 143–192. Kluwer/Plenum, New York.

Milisauskas, Sarunas and Janusz Kruk. 1993. Archaeological Excavations in Neolithic and Bronze Age Sites in Southeastern Poland. In Peter Bogucki, ed., *Case Studies in European Prehistory*, pp. 63–94. CRC Press, Boca Raton, Fl.

Milisauskas, Sarunas and Janusz Kruk. 2002. Middle Neolithic: Continuity, diversity, innovations, and greater complexity. In Sarunas Milisauskas, ed., *European Prehistory: A Survey*, pp. 193–246. Kluwer/Plenum, New York.

Mohammed-Ali, Abbas S. A. 1987. ????_title_????. In Angela E. Close, ed., *Prehistory of Arid North Africa: Essays in Honor of Fred Wendorf*, pp. 123–136. Southern Methodist University Press, Dallas.

Nguyen, Khac Su., Pham M. Huyen, and Tong T. Tin. 2004. Northern Vietnam from the neolithic to the han Period. In Ian Glover and Peter Bellwood, eds., *Southeast Asia: From Prehistory to History*, pp. 177–208. RoutledgeCurzon, New York.

Parsons, Jeffrey R. 1974. The Development of Prehistoric Complex Society: A Regional Perspective from the Valley of Mexico. *Journal of Field Archaeology* 1:81–108.

Pearson, Richard and Anne Underhill. 1987. The Chinese Neolithic: Recent Trends in Research. *American Anthropologist* 89(4):807–822.

Peregrine, Peter N. 2004. Cross-Cultural Approaches in Archaeology: Comparative Ethnology, Comparative Archaeology, and Archaeoethnology. *Journal of Archaeological Research* 12(3):281–309.

Perlés, Catherine. 2001. *The Early Neolithic in Greece*. Cambridge University Press, Cambridge.

Phillipson, David W. 2005. *African Archaeology*. Third edition. Cambridge University Press, Cambridge.

Possehl, Gregory L. 2002. *The Indus Civilization: A Contemporary Perspective*. Altamira Press, Walnut Creek.

Price, T. Douglas and Anne B. Gebauer. 1992. The Final Frontier: Foragers to Farmers in Southern Scandinavia. In A. Gebauer and T. D. Price, eds, *Transitions to Agriculture in Prehistory*, pp. 97–116. Monographs in World Prehistory 4. Prehistory Press, Madison.

Santley, Robert S. and Philip J. Arnold III. 1996. Prehispanic Settlement Patterns in the Tuxtla Mountains, Southern Veracruz, Mexico. *Journal of Field Archaeology* 23(2):225–249.

Schwarz, Frederik A. and J. Scott Raymond. 1996. Formative Settlement Patterns in the Valdivia Valley, SW Coastal Ecuador. *Journal of Field Archaeology* 23(2):205–224.

Shelach, Gideon. 2000. The Earliest Neolithic Cultures of Northeast China: Recent Discoveries and New Perspectives on the Beginning of Agriculture. *Journal of World Prehistory*, Vol. 14(4):363–413.

Shih (Shi), Xing-bang. 1992. The Discovery of the Pre-Yangshao Culture and its Significance. In M. C. Aikens and S. N Rhee, (eds.), *Pacific Northeast Asia in Prehistory: Hunter Fisher Gatherers, Farmers and Sociopolitical Elites*, Washington State University Press, Pullman, pp. 125 132.

Steel, Louise. 2004. *Cyprus before history: From the earliest settlers to the end of the Bronze Age*. Duckworth, London.

Toom, Dennis L. 1992. Early Village Formation in the Middle Missouri Subarea of the Plains. In Dale E. Croes, Rebecca A. Hawkins, and Barry L. Isaac, eds., *Long-Term Subsistence Change in Prehistoric North America*, pp. 131–191. Research in Economic Anthropology, Supplement 6. JAI Press, Greenwich, CN.

van Andel, Tjeerd H. and Curtis N. Runnels. 1995. The Earliest Farmers in Europe. *Antiquity* 69: 481–500.

Wallace, Henry D. 2003a. Prelude. In Henry D. Wallace, ed., *Roots of Sedentism: Archaeological Excavations at Valencia Vieja, a Founding Village in the Tucson Basin of Southern Arizona*, pp. 1–24. Anthropological Papers 29. Center for Desert Archaeology, Tucson. Read pp. 21–23.

Wallace, Henry D. 2003b. The Development and Structure of an Ancient Desert Village. In Henry D. Wallace, ed., *Roots of Sedentism: Archaeological Excavations at Valencia Vieja, a Founding Village in the Tucson Basin of Southern Arizona*, pp. 323–370. Anthropological Papers 29. Center for Desert Archaeology, Tucson.

Wallace, Henry D. and Michael W. Lindeman. 2003. Valencia Vieja and the Origins of the Hohokam Culture. In Henry D. Wallace, ed., *Roots of Sedentism: Archaeological Excavations at Valencia Vieja, a Founding Village in the Tucson Basin of Southern Arizona*, pp. 371–406. Anthropological Papers 29. Center for Desert Archaeology, Tucson.

Warrick, Gary. 1990. A Population History of the Huron–Petun, A.D. 900–1650; Unpublished Ph.D. dissertation, Department of Anthropology, McGill University.

Warrick, Gary. 2000. The Precontact Iroquoian Occupation of Southern Ontario. *Journal of World Prehistory* 14(4):415–466.

Warrick, Gary. 2006. Comment on "Testing the Hypothesis of a Worldwide Neolithic Demographic Transition,". In J. P. Bocquet-Appel and S. Naji, eds., *Current Anthropology* 47:355.

Wilshusen, Richard H. 1999a. Basketmaker III (A.D. 500–700). In William D. Lipe, Mark D. Varien, and Richard H. Wilshusen, eds., *Colorado Prehistory: A Context for the Southern Colorado River Basin*, pp. 166–195. Eagle: Colorado Council of Professional Archaeologists.

Wilshusen, Richard H. 1999b. Pueblo I (A.D. 750–900). In William D. Lipe, Mark D. Varien, and Richard H. Wilshusen, eds., *Colorado Prehistory: A Context for the Southern Colorado River Basin*, pp. 196–241. Eagle: Colorado Council of Professional Archaeologists.

Wilshusen, Richard H. and Scott Ortman. 1999. Rethinking the Pueblo I Period in the Northern Southwest: Aggregation, Migration, and Cultural Diversity. *Kiva* 64:369–399.

Wright, Henry T. 1977. Recent Research on the Origins of the State. *Annual Review of Anthropology* 6:379–397.

Yan, Wenming (1999). Neolithic settlements in China: Latest finds and research, *Journal of East Asian Archaeology* 1(14): 131 147.

Zeidler, James A. 2003. Formative Period Chronology for the Coast and Western Lowlands of Ecuador. In Scott Raymond qnd Richard Burger, eds., *Archaeology of Formative Ecuador*, pp. 487–527. Washington D.C.: Dumbarton Oaks.