AMBIGUITY AND THE SELF-EVIDENT IN THE STUDY OF SEDENTISM

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ABSTRACT

The thesis considers the basis and the logic of the propositions made in the past 300 years about the transition from a mobile lifestyle to a sedentary one, assessing the propositions in relation to their intellectual milieu. No particular position is defended or legitimated, nor is the study an attempt to create new definitions of sedentism or to seek to identify new indicators of sedentism in the archaeological record. Instead it considers how other people have sought to do this, in order to assess whether there has been something inherently problematic in the assumptions and logic that have been used. The study illustrates its point primarily through a review of English language scholarship with some small inclusions of English translations of opinions expressed in other languages.

No stabilised, agreed or paradigmatic theories exist concerning a shift to sedentism, despite that transition being a major change in human behaviour, partially associated with the expansion of agricultural economies and integral to the development of urban life and the huge population increases of the last 8,000 years. Notwithstanding the scale and importance of the phenomenon, with a few notable exceptions, theorising on the subject has involved both ambiguity and the apparently self-evident.

There is considerable ambiguity in English language definitions about what constitutes sedentism, and this becomes more complicated when definitions and opinions from other languages and cultural backgrounds are incorporated. The terminology and classifications used by scholars have been, and still are, ambiguous, and this makes any "answer" problematic because the various opinions and debates do not refer consistently to the same phenomena or to their relationship to other components of human behaviour. There are also differences in regional interpretations. Several interrelated debates and topics add to the complexities and ambiguities, such as the relationship between sedentism and agriculture, the nature and residential behaviour of complex hunter-gatherer communities and the characteristics of pastoralism.

The "self-evident" component had its genesis in the 18th century, when social philosophers proposed linear progression models of human development, which have had a continuing influence on archaeological assumptions about the process of becoming sedentary. By the later part of the 20th century some scholars were re-engaging with the issue and reassessing these assumptions, but the fundamentals are still not resolved, despite scholars often writing as if they are.

Additional problems further complicate the study of the formation of sedentary communities. Unlike other aspects of human behaviour, there is no comparable theory or empirical data on sedentising in other animal species. This has meant that archaeological theorists cannot either "borrow" theory from the biological sciences or test their predicates against its evidence. There are also difficulties with the use of ethnographic analogy to retrodict recent sedentising trends to the conditions prevailing at the time societies initially became sedentary. The problem is that the previous circumstances must logically be considered to have differed from current and recent circumstances in which people making a transition to sedentary life already know about other people who are sedentary.

There is, of course, a difference between the processes involved in a community becoming settled, or sedentising, and the state of a community residing in one place, or being sedentary, often referred to as sedentism. Becoming sedentary was a process, not an instantaneous change. The majority of communities around the world became sedentary before writing or other recording systems were introduced. It is not, therefore, possible to directly study the social processes through which communities became sedentary, only what remains in the archaeological record. The archaeological signatures of the transition continue to be a topic of inconclusive debate despite the recent use of new analytic technologies. An operational analysis will be necessary, to consider what sedentism actually was at the time of the initial transitions, rather than defining it in contrast to something else. To proceed further with a coherent analysis of sedentising will likely need the discovery of an unequivocal marker, possibly biomechanical or biochemical, for a newly sedentary population before any agreement can be reached on the definition of sedentism. A universally agreed definition of what is meant by the terms "sedentism" and "becoming sedentary" in the prehistoric context is required for future investigations to be coherent and a more cohesive concept of sedentism to be actualised.

PREFACE

The scholarly study of the initial transitions to sedentism has been a rather unstructured mix of ambiguity and assumed self-evidence. As a consequence, presenting the thesis requires a structure which is independent of the subject. This is why the middle five chapters of the thesis provide a historical overview of the problems which have repeatedly occurred through the study of sedentism and sedentising over the last three hundred years, rather than an overview of the issues involved. Chapter 1 gives a broad overview of the issues and Chapter 2 covers the substantive theoretical problems. Chapter 8 returns to an overview of the issues, and Chapter 9 highlights the situation currently faced by archaeological scholars and covers potential opportunities. The purpose of the thesis is not to provide an answer to the question of why sedentising occurred in the past, or what the definition of sedentism should be, but rather sets out the reasons why such answers have not come about and the ways in which scholars have approached the issue. There are, at present, no agreed definitions or explanations.

Although the term sedentism and its associated terminology is used throughout the thesis, in line with common practice, it is not intended to give the impression that there is any certitude as to precise meaning in the circumstances in which it is used. Australian spelling has been used in this thesis, except where exact quotations are taken from publications.

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PART I – BACKGROUND AND OVERVIEW

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> *'The formation of "sedentary" communities is one of the most controversial and complicated issues of archaeological theorising.'* (Fletcher, 1995, 170)

1.1 Introduction

The conundrum of sedentism stems primarily from the 19th and early 20th century legacy of stage theory models for the progression of human society, which had seemed to make a path to sedentism an inevitable and apparently desirable development. There is a tendency among scholars to assume that the rationale of linear stage theory is either correct, self-evident and unchangeable or is out of date and they are no longer using its logic. Neither is the case. Ambiguity compounds the problem of theorising about the formation of sedentary communities because of the lack of definitional agreement on what sedentism actually is, or what is represented by the term. Sedentism is used as a label by different scholars, and in different regions of the world, in disparate ways to describe and analyse varied observed phenomena in the archaeological record and behaviour reported in the literature. An air of the "self-evident" pervades the use of the term, while ambiguity prevails in the scholarship on the subject of sedentism and its development. Several interrelated debates and topics also add to the complexities and ambiguities, such as the nature and residential behaviour of complex hunter-gatherer communities and the role of nomadic pastoralists. A particular problem is that the issue of how sedentism initially came about has been resumed into other debates about the availability of resources and the shift to agriculture.

There are many factors that have led to ambiguity in consideration of the initial transition or transitions to sedentism. These include the fact that there is no agreed understanding of what sedentism/sedentising actually was in prehistory or agreed definition of what it represented, particularly how long communities needed to live in one location to be considered permanent.

The term "sedentism" is a catch-all concept, where users seem to assume that everyone is referring to the same thing, whereas in fact they are not. There is confusion about many

residential/economic categories, including those relating to pastoralism and nomadism, and meanings and definitions have changed through time. Early unilinear stage theory concepts set the pattern for the assumption of an automatic development to sedentism, leading to the way that it is considered a self-evident progression. Prior to the later 20th century, there was no concept that being sedentary in a "civilised" society might not necessarily be the best or only way to be. In the earlier 20th century, Childe set the pattern for the way in which scholars would address the changes which happened in the Neolithic. There was, and to a certain extent still is, the concept that if communities had what were considered to be the material correlates of sedentism, such as ceramics and rectilinear buildings, then the community must have been sedentary. The self-evident conflicts with the reality of plural trajectories to different residential statuses in the past, and the ambiguity prevents the development of a coherent debate.

Mithen wrote that 'archaeologists have long debated and discussed why people began living in settled communities' (Mithen, 2007, 705), but this long debate has not yet resulted in an agreement on or answers to the question. The debate and discussion had its primary genesis in the 18th century, when social philosophers proposed unilinear progression models of human development. The foundations of the topic and the more general issues of the "sedentism debate" lie primarily in writings from the 18th and 19th centuries, which propounded theories of the so-called "progress" of humankind in stages, advancing only in one direction from what was seen as "savagery" through to "civilisation". These early writings are the source of many of the ambiguities and much of the lack of clarity surrounding the issue and have continued to influence archaeological and anthropological thought into the 21st century. The initial scholarship on residential practices was not founded on empirical data or even comparison, as the early writers did not have access to such direct information. Rather, they were obliged to conceptualise the process from the beginning, without recourse to previous scholarship on which to base their assumptions. They had no empirical data and generally based their writings on analogy to a very partial sample of contemporary societies. Much of their work relating to peoples in other continents was based on second or third-hand accounts from travellers, often written many years after the initial encounter with those peoples. Notwithstanding these limitations, in the absence of other theory their models continued to have an influence on archaeological thought on the processes of becoming sedentary which has continued at least until the late 20th century.

While some issues have been academically recognised as consequences of sedentism, the transition from mobility to a settled lifestyle has not received the same critical reappraisal as topics such as the development of agriculture, which is no longer simply seen as either

a likely or even inherently desirable development. Hey, Mulville and Robinson re-examined evidence relating to the Neolithic reliance on cereal cultivation, particularly at the Yarnton, Oxfordshire, site. They concluded that although cereals were important, evidence for the Middle Neolithic to the Early Bronze Age in that part of the UK demonstrated continuing use of the landscape by mobile pastoralists, possibly on a seasonal basis, as just one part of their subsistence strategy (Hey, Mulville, & Robinson, 2003, 87), showing that the linking of agriculture and sedentism is not as self-evident as is sometimes assumed.

As Rosenberg has noted, 'current explanations for the evolution of fully sedentary lifeways suffer from serious deficiencies' (Rosenberg, 1998, 653). There is little agreement, and some avoidance of the problems. Kuijt, for example, noted in 2000 that the topic of Neolithic social organisation had, until very recently, been bypassed by Near Eastern archaeologists because of its complexity. Instead, those scholars had focussed on material culture, economic practices and the origins of agriculture (Kuijt, 2000a, 4). The main focus of this study concerns the role of assumptions about sedentism in the current debates on the issue, the nature of the previous and current debates and assesses the circumstances in which the divergent discussions which characterise these debates have occurred. By investigating the history and logic of the problem that has arisen about what is meant by the term "sedentism" and the "process of becoming sedentary", the causes of the current mixture of ambiguity and the apparently self-evident can be clarified.

This thesis is a review of the way in which the opinions of earlier scholars have influenced later thought on the subject. It is not intended as a critique of the positions of particular scholars, but rather as an analysis of the logic of the opinions and comments on the nature of sedentism, its definition and identification, illustrated by the work of those scholars, and the problems that have arisen from the logic used. These are not unchanging positions, but are persistently recurring elements of the discussion. One persistent theme is the role of the concepts of stage theory and progressionism contained within the prevalent notions of cultural evolution. This study will not, however, say more about an evolutionary theory of culture, except to report on the propositions where relevant in scholars' particular positions. "Cultural evolution" is so plural a proposition and so little agreed upon in itself that to deal with it in any depth would require another thesis (see Dunnell, 1989; Wu, 2011, for example). The argument in this thesis does not presume that the current spectrum of views on cultural evolution subsumes the possibilities of an evolutionary theory for culture.

The aim of the thesis is not to demonstrate what sedentism or sedentising may or may not be. What is actually being talked about is itself part of the problem. The study is not an empirical analysis of sedentising, or an attempt to be a history of everything everyone has proposed or theorised about sedentism. The aim is not to criticise or attempt to affirm or deny any specific positions held by scholars, nor to create new definitions of sedentism or to identify or to specify or advocate particular new indicators for its identification in the archaeological record. Nor will the thesis seek to assess or evaluate the arguments about the root causes of, or the factors involved in, pre-literate societies changing their mode of living to a sedentary one. Rather, it is an analysis of the assumptions and commonly-held logical problems which are built into the debate, and an assessment of the ancestry and development of those issues, leading to an assessment of what may be needed to begin resolving the problem. The basic point is that the operational characteristics of sedentism are what is important, not the definitional ones. What is required for sedentary behaviour to function, what effects it has and what outcomes it creates are the big issues. David Harris began such a discussion in the early 1970s, but there has been no definitive conclusion to it.

Together the assumptions and logic used have made the analysis of the transition or transitions to sedentism problematic, because the term is not used consistently and the descriptions of the concepts tend to be nebulous. To deal with the ambiguity and the assumed self-evidence of the debates, tackling the problem of what sedentism is and how it initially came about will ultimately require concurrent new analytic thinking – probably not in the terms generally used, at present, to mean different things in different regions and periods – combined with a substantial empirical study of the indices and operational characteristics of sedentism.

The terms sedentism, sedentary settlement and associated designations are used to cover a range of lengths of occupation of a site by a prehistoric community. These vary from a few months, or seasons of the year, through to more strict definitions such as the conventional all-year residence. In 1954, Muller-Wille even proposed to refer to settlements lasting from 5-30 years as ‘semi-permanent’, and to settlements lasting for several generations as ‘permanent’ (Muller-Wille, 1954, esp. 156-158). Fletcher has argued that settlements need to be continuously occupied for at least five to seven years to be considered sedentary (Fletcher, 1998, 115, 120). Jarman, Bailey and Jarman noted that there were, also, many ways of seeking to classify mobile economies, covering the varied types and behaviours of hunter-gatherers, herders and transhumant pastoralists. They noted that there were also a wide variety of sedentary economies, with many in fact including an element of mobile-cum-sedentary behaviour (Jarman, Bailey, & Jarman,

1982, 45-46). Theorising is made difficult by the inconsistency, ambiguity and vagueness that have pervaded elements of the discussion of the subject. There is no agreed definition of what is meant by the term sedentism, or its variants, nor of any of its associated terminology. If definitions are changed, for example, if hunter-gatherer communities previously categorised as sedentary are redefined as definitely mobile, this alters a whole suite of implications, especially those connected with the claims for the possibility of sedentism before agriculture (e.g. Gebauer & Price, 1992; D. R. Harris, 1990). The different definitions do have substantially different implications for the relationship to other factors such as agriculture.

If the definition of a mobile community refers to its inhabitants staying in one place for up to five to seven years, then agriculture of all types could easily be carried out and the conventional security provided by "one-year sedentism" applies for communities defined as "mobile". The development of agriculture would then no longer be a significant causal factor in the development of sedentism, as mobility would include staying in one place for several years. Conversely, agriculturalists can in some circumstances be mobile, as is known ethnographically from the Marind Anim of Irian Jaya, for example, then agriculture cannot require sedentism in a conventional sense. The Marind Anim planted crops, left them to go on hunting expeditions, and returned months later to harvest the crop. The Rarumi of northern Mexico, the Pawnee and the Osage Indians behaved similarly (Kelly, 1992, 52). Archaeology has now shown that was also the case in the more distant past for example with apparently mobile communities in the agricultural "Neolithic" of the United Kingdom (e.g. Thomas, 1999; Tipping, 2010). The sedentism-agriculture nexus is therefore not valid, meaning that it is unlikely that fruitful arguments will be developed on the basis of the assumption that sedentising hunter-gatherers moved to agriculture. They may have, but that will be only one of several trajectories. The potential variety of trajectories to the formation of large settlements and large communities, both mobile ones and sedentary ones, needs to be further investigated (Fletcher, 1991; 1995, 99-125).

In addition, the regionalism of archaeological scholarship has a significant impact on the discussion. There have been vigorous regionally based views and research foci in the study of sedentism and mobility. Trigger noted that there is considerable variation in different regions in the problems that archaeologists consider worth investigating, and also in how they interpret evidence (Trigger, 2007, 67). There are strong links in North America between anthropological research and ethnographic studies, which may have influenced the way research is conducted. North American scholars are very aware of the

ways in which Indigenous people use mobility, for example, the way in which Inuit populations move to igloos in wintertime to protect themselves against the elements.

Even within similar regional areas, for example in North America, there have been many different approaches. Rafferty, for example, noted that in studies on the Archaic and Woodland periods in eastern North America, culture historians had adopted an essentialist view of settlement-subsistence relationships to characterise settlement pattern changes, whereas other scholars have used selectionist theory with detailed examination of variability to explain the changes (Rafferty, 1994, 405). As Habu and Fawcett point out 'archaeological practice in each country is shaped by its social, political, and economic contexts both domestically and internationally' (Habu & Fawcett, 2008, 91). Archaeology has sometimes been used to promote concepts of nationalism and identity. This happened in Japan before and after the end of the Second World War, as the Japanese strove to redefine their identity, particularly in relation to the Yayoi and succeeding cultures (see Fawcett, 1995; Hudson, 1999). The regional differentiation of definitions necessarily increases the confusion in the ways in which the terms mobility and sedentism are used, and reduces the capacity for cross comparison of a necessarily global phenomenon.

There are also no universally agreed scholarly definitions of other terminology which is used to describe the full gamut of residential status, from "mobile" to "urban" and beyond. As Cowgill has noted, urbanism and cities, too, are often under-theorised (Cowgill, 2004, 1). Similarly, Storey noted that urbanism has come close to being defined as whatever scholars in a given region wish it to be (G. R. Storey, 2006, 2). If some consensus and clarification can be reached on the definition of sedentism, which is recognised as being more problematic than some other issues of residential status, it may, in turn, help to redefine the way urbanism is approached.

As well as the inter-regional ambiguities there is a profound problem of conceptualising conditions as they were at the initial transition to sedentism, rather than attempting to explain the change with contemporary cases. The retrodiction using contemporary cases has led to assumptions about behaviour in the past which may well be unfounded.

Scholars are trying to explain this change:

Conditions prevailing at transition		Conditions now, current assumptions
	Retrodiction	

When they actually need to explain this change

Conditions prevailing at transition		Conditions after transition to sedentism
	Actual change	

Although scholars have recognised that pasts are not "frozen" and that many changes have occurred in the last ten thousand years, it has still not been made clear that what can be seen in sedentising societies in the present day or recent past is a considerable transformation from what originally took place at the initial, prehistoric transitions. Effectively, some scholars are trying to project current or recent sedentary practices and sedentising processes back as much as ten thousand years.

As Fletcher has remarked, two different types of uniformitarianism were defined by Gould – substantive uniformitarianism and methodological uniformitarianism. Gould posited that concepts of uniformitarianism had suffered from both theoretical errors and common-sense fallacies because these two notions were not clearly separated by Lyell. Whereas methodological uniformitarianism developed from the concept that there is order and consistency in the universe, substantive uniformitarianism extrapolates rates or associations from the present into the past (Gould, 1965, 1987) without an operational explanation for the phenomenon. Fletcher emphasised that, while studies of human behaviour could use the logic of the historical sciences, it was important to apply a consistent analytic premise to making sense of the past 'without imposing a logically invalid, substantive equivalence to the present' (Fletcher, 1995, 230). Correlations in the present do not, in themselves, predictively extend into the past (see also Cameron, 1993). By contrast an operational model e.g. of genetics is a form of methodological uniformitarianism and can logically be extended into the past.

Ethnographic associational analogy has frequently been used to make assumptions about the structure and residential stability of prehistoric settlements. As Sheehan has written, 'for an archaeologist trying to "reflesh" the figurative "bones" of the archaeological record, ethnographic data can be very seductive indeed' (Sheehan, 2004, 163). However, as Renfrew points out, such analogising can be a problematic exercise. Contemporary hunter-gatherer societies have undergone millennia of evolution in the same way as agrarian villages and urban societies, and in many cases they have also had at least some interaction with modern urban populations (Renfrew, 1998, 4). Politis noted out that contemporary forager societies are often already on the path to sedentism by the time that ethnoarchaeologists come into contact with them (Politis, 2006, 23). Thus these contemporary hunter-gatherer societies are not pristine "examples" of how life was lived in the past, and their modes of behaviour and settlement patterns cannot be cited as precise or complete depictions of past communities. Analogising for the processes of becoming sedentary is even more complicated. The sedentising of mobile communities in the modern world cannot be regarded as an analog for initial sedentism, because the ways of being sedentary today are readily observable by those making or being forced to make the transition. The lifestyles of sedentary people today are also quite different from the way in which communities would have lived at the time of their initial transition from mobility.

There are, of course, ways in which ethnographic studies can help scholars deepen their understanding of the past. Halstead noted, for example, that such studies had demonstrated that farmers were not necessarily tied to a fixed place of residence by either agriculture or by the storage of agricultural products (Halstead, 2005, 38). Daniel wrote in 1962 that the use of ethnographical parallels was 'fair and just' to a certain extent in that some prehistoric artefacts could only be understood by comparing them with tools used by 'modern primitives'. Importantly, however, he cautioned that parallels should not be carried beyond the material culture into assumptions of the social structure of prehistoric societies, quoting Ehrenburg 'it is a delusion to think that "experimenting" with the so-called primitives of yesterday and today provides scientific material for prehistory and history' (Daniel, 1962, 129).

Zvelebil and Fewster, summing up a volume on different ethnoarchaeological approaches, wrote:

> 'It is our belief that uses of ethnographic analogy, and of uniformitarian analogies, too, have often led to the generation of a lamentable uniformity in the perception of hunter-gatherer communities, past and present, and to the development of a unilinear

evolutionary trajectory marked by the establishment of false impressions of sameness across time and space' (Zvelebil & Fewster, 2001, 154).

Some scholars regard Eder's 1984 paper *The Impact of Subsistence Change on Mobility and Settlement Pattern in a Tropical Forest Foraging Economy: Some Implications for Archeology* as a seminal work and important for the study of sedentism. However, others do not use it in that context because it was an ethnographic study and therefore not necessarily helpful in evaluating the archaeological record of communities millennia before, and the population Eder studied have themselves undergone many changes through time.

Binford and Johnson wrote in 2002 that in 1980, when *Willow Smoke and Dog's Tails* (Binford, 1980) was published, 'the dominant view in anthropology was that the Kalahari San were representative of Paleolithic hunter-gatherers anywhere around the globe under any environmental conditions'. At that time it was generally considered that there was no important diversity among hunter-gatherer societies except that related to 'colonization, acculturation, or other "corrupting influences" '. They noted that Binford had written of the forager-collector continuum in an attempt to show that there were genuine hunter-gatherers who were not organised like the San (Binford & Johnson, 2002, viii). This of course was a demonstration at the ethnographic level. Price noted that it is important to remember that scholars are still discovering how much variability there is in both the ethnographic and the archaeological record (Price, 2002, 419).

Finlayson and Warren (2010) highlighted the way in which modern day conceptions of the Neolithic, and in particular of early villages and the transition to agriculture have been in the past, and continue to be, coloured by contemporary experience and the 'rural romance' ideas of the origins of what is familiar to today's society. They noted that the central contention of their book *Changing Natures: Hunter-gatherers, first farmers and the modern world* is that:

> 'the usual narratives about such matters rely on stereotypes and simplistic notions of who hunter-gatherers and farmers really were, and still are, and that the narratives themselves are best understood as reflections of how we perceive our place in modern, predominantly urban society. We compare early prehistoric rural people with modern urban ones, as this is the contrast that is drawn upon in our imaginations' (Finlayson & Warren, 2010a, 13).

No historical textual sources exist for the initial transition to sedentism, that is, in circumstances in which there has been no contact with already sedentary societies, so

there is no available explanation or interpretation from the logic of a related field of enquiry. Archaeological reconstruction has tended to work on what it can know from the present to retrodict to the past. Substantive ethnographic analogy using modern cases of societies becoming sedentary cannot be used as an index for the initial sedentary transition, as the modern cases involve contact with and knowledge of obviously permanent, sedentary communities. We thus have neither direct "lived" analogy nor verbal evidence to assist us. Therefore the discipline of constructing a model of the processes through which communities became sedentary has to be derived from how we think about it and how we perceive and analyse the archaeological record itself. A complication, of course, in the study of sedentising in the archaeological record is that assumptions are made about the social processes involved and about the relationships between social and material phenomena, and these add to the ambiguity and the difficulty in appraising and explaining the residential status of prehistoric communities.

In addition, a further complicating analytic "gap" which has not yet been systematically investigated and which contributes to the problem, is the lack of an equivalent theory in some other different field of inquiry. Unlike many other aspects of human behaviour, there is no comparable theory on a transition to sedentism for other animal species. Although there are many species of animals and other creatures that practise forms of residential stability such as rabbits and gophers, there has been little scientific discussion of the behaviour involved in the conditions of residential stability exhibited in non-human species or of a shift from a previous condition of residential mobility. Therefore archaeologists are "on their own" both theoretically and analytically when considering the transition to sedentism by humans, and do not have "borrowable" theory from the biological sciences against which to test their predicates. In addition, the fact that some animal species do live in residential, locationally stable communities shows that it is possible to be sedentary without the "social" aspects usually attributed to humans who are living such a lifestyle.

1.2 Ambiguity and the Self-evident

As Pluciennik has written, 'many of the "big" questions of origin and transition in (pre)history and archaeology are predicated upon a certain view of the past which often derives directly from the stages defined by social evolution'. He went on to theorise that the transition from foraging to farming and the questions of the origins of agriculture had been the focus of so much attention because they are viewed as massive discontinuities, or revolutions, which require particular forms of explanation (Pluciennik, 2005, 15).

Similarly, becoming sedentary can also be viewed as a massive discontinuity and a revolutionary change in human behaviour and requires comparable forms of explanation. So far, these have not been adequately provided to the general agreement of the discipline of archaeology or the social sciences.

Social philosophers in the 18th and 19th centuries attempted to identify laws that governed the course of human history and the development of cultural systems, and the linear progression themes many of them developed formed the framework for theory and sociocultural research which lasted into the later 20th century (M. Harris, 1968, 9). These scholars did not use archaeological evidence and had no way to construct chronologies. Instead they used 'theoretic' or 'conjectural' history to map out the development of cultural complexity (Trigger, 1998, 37). Bryson noted that these philosophers' concern with natural laws was influenced by Descartes' position that 'there is order and uniformity in the universe on which men can count' (Bryson, 1945, 23). Some of the Enlightenment period scholars theorised on the concept of individual ownership of property, positing that such a concept would be necessary before societies began to settle down, and this idea was also taken up by later scholars. Smail noted that in the 17th century, Pufendorf had theorised the establishment of private property as having been the marker between primitive and modern society (Smail, 2008, 17). There is, of course, no actual evidence that there was any understanding or recognition of the concepts of property and individual ownership before historical records began, since such texts only came well after what is generally accepted as the initial transition to sedentism in the majority of communities.

Starting at least from the time of Aristotle, with the tradition continuing until the 20th century, scholars appear to have regarded it as obvious that everyone would want to become "civilised", and their theorising and observations were thus biased by this premise. As part of this intellectual tradition, the transition to sedentism appears also to have been viewed by most scholars prior to the mid-20th century as self-evident, and as an automatic development which would eventually be adopted by almost all societies as they became increasingly more "advanced"' and complex. These assumptions of an automatic progression to sedentism meant that the majority of the processes involved in becoming sedentary were not considered in detail. The self-evident viewpoint also led to the lack of a critical reappraisal of the unilinear stage theories by later scholars. It is only in the last few decades that such critical reappraisals have started to emerge, and although scholars may no longer subscribe to the stage theory approach, traces of it appear to still persist in archaeological scholarship. As Soffer critically noted in 1985, despite changes in concepts of hunter-gatherers as necessarily being part of small, simple and mobile communities, archaeologists were still considering cultural change 'in a linear and

monolithic fashion'. She argued that hunter-gatherer economic and socio-political complexity in fact fluctuated in complexity during the Upper Palaeolithic, in response to particular local conditions (Soffer, 1985, 235). In particular, she showed that cloth and weaving were present in hunter-gatherer communities of the Upper Palaeolithic in Ukraine – an attribute that ought, on conventional stage theory, only to occur with farming communities (Soffer, 2000).

Wengrow suggested that the staging focus in Childe's identification of the Neolithic Revolution (with the invention of agriculture) and the Urban Revolution (with the invention of writing and the beginnings of large-scale cohabitation) has obscured the significance of the period in between, with its major developments in village life (Wengrow, 2010, 54-55). Although in that publication Wengrow was referring in particular to the fifth millennium BC in the Near East, his comment highlights the general lack of consideration given to the processes involved in humans becoming fully sedentary and what the necessary prerequisites for settling down actually were. Similarly, David Harris has suggested that:

> 'preoccupation with the search for "the origins of agriculture" has diverted attention from the broader question of how mobile "hunter-gatherer" bands gave way, as a dominant mode of human organisation, to permanently settled, complex communities' (D. R. Harris, 1977b, 402).

As an example of this, Moore wrote that the establishment of agriculture was 'the most important event ever to have taken place in the human career', but noted that it had only been in the last two decades that scientific analysis has begun to lead to an understanding of how this transformation came about. He credited Gordon Hillman's research on early crop domestication in western Asia with being pivotal (A. M. T. Moore, 2009, 8).

The presumed initial transition from a mobile way of life to a sedentary way of life is currently considered to have happened within the marked transitions noted in the graphs of changes in site sizes, below (Figures 1-8) in various regions in different and apparently unconnected parts of the world within a fairly short time-span compared with the existence of modern humans. The same appears to be the case for domestication and the beginnings of agriculture. There is no doubt that there is a relationship between sedentism and agriculture but there is not demonstrably or necessarily a simple causal correlation or explanatory connection. The general assumption is that there was a requirement for a substantially more complex social and economic structure with the adoption of agriculture. Tipping, however, in discussion of whether climatic stress forced the adoption of agriculture in the British Isles, posited that it should not be assumed that early agriculture did in fact require a more complex society (Tipping, 2010, 66). This

thesis will not be examining this issue in detail, because it is a very large topic and outside the scale of the study.

The ongoing issues are illustrated in numerous recent discussions. Writing in 1998 about the settlement of the Konya Plain, in Anatolia, Watkins noted:

> 'There is a good deal of debate among those interested in the subject of the beginnings of sedentary village life and farming. A powerful consortium of specialists agree that the earliest sedentary villages arose in western Syria, the Jordan valley and Israel in the Natufian complex, starting somewhere a little before 9,000 BC. … Others, however, suspect that the arena within which these important transformations of the way of life took place was a good deal wider, and that the demographic landscape was rather fuller from an earlier period' (Watkins, 1998, 30).

In his 1999 definition of the Neolithic, Thomas questioned why so many archaeologists studying the Neolithic in southern Britain had worked hard to convince themselves that the people had lived permanently in substantial houses. He wrote that this conviction could be related to an ancestry in unilinear evolutionism 'which demands that all Neolithic people, having advanced beyond the Mesolithic, should practise mixed agriculture, should be sedentary and should live in houses'. Thomas noted that although there was surviving monumental architecture, demonstrating that the communities had been sophisticated, the available evidence in fact indicated variations in mobility and residence patterns. He also noted that it was often assumed that farming practices in lowland England had remained the same until at least the arrival of the Romans, if not later, with concomitant assumptions that such agriculture would have been able to support large populations. Thomas wrote that 'population pressure has come to be seen as a driving motor in many accounts of the British Neolithic' (Thomas, 1999, 10). However, the suggestion that premises about demography in relation to sedentism are problematic is illustrated by Riede's observation that 'a realistic estimation of demographic parameters for individuals and populations in early prehistory remains extremely challenging'. Riede noted that excavated skeletal remains of any population before the emergence of sedentary agricultural communities was so limited and biased that it was 'virtually useless for demographic inferences' (Riede, 2009, 310).

In the introductory chapter to *(un)settling the Neolithic* (2005), Bailey and Whittle noted the need to recognise the limitations of the central concepts and structures that underlie research into the Central and Eastern European Neolithic. They posed the questions:

> ‘Are we satisfied with our use of concepts such as sedentism and mobility, or domestic economy?
>
> Are we aware of the inherent assumptions that accompany ideas about the origins of or transitions to the Neolithic?
>
> Are we at ease with the very idea of an entity that we call the “Neolithic”?’ (Bailey & Whittle, 2005, 1)

Bailey and Whittle wrote that there was, by 2003, a common aim in many studies of the Neolithic, particularly in central and Eastern Europe, to document the distinctions between sedentary and mobile communities which were central to many traditional definitions of Neolithic behaviour. They made the important statement:

> ‘a significant justification for these definitions is the assumption that what we understand as sedentism and mobility can be read from reconstituted records of homogenous, repeated, static human behaviour of the past. Importantly, the majority of serious searches for sedentism/mobility in the past rely on the use of proxy evidence.’ (Bailey & Whittle, 2005, 2)

King posited that the Mesolithic and the Neolithic of the British Isles should be regarded as one continuous entity rather than as two separate ones and that the pattern of the disposal of the dead in Neolithic Britain was a corollary of mobility not of communities staying in one place. He theorised that distinctions between the two were in fact attributable to a tacit assumption that human social behaviour in the Neolithic was similar to recent European agrarian community behaviour and was indeed its ancestry. King noted that current archaeological theory ‘normalises’ past human behaviour by analogising with known behaviour patterns of the present time (King, 2003, 271), continuing the long tradition established in the 17th century in Europe on the study of “others”.

Along with King, in the last few decades other scholars have attempted to clarify issues relating to the study of sedentism. Although sometimes referred to as the “sedentism debate”, there has, effectively, been ongoing debate without a direction, because there is a disjunction between the various concepts of sedentism (as will be detailed in Chapter 2) and the transition to that residential state, and there is no agreed reference point around which a debate can take place. The terminology and classifications used by scholars since the 18th century were, and still are, ambiguous, and this makes any “answer” problematic because the propositions being discussed are not consistent. As Shewan pointed out:

> ‘commensurate with the degree of difficulty of recognizing sedentism is the task of adequately defining the concept. While there have been numerous discussions

> about sedentism, and its presence or absence in the archaeological record, there remains great ambiguity in the use of the term' (Shewan, 2004, 57).

As Ogilvie has noted, it can be difficult to distinguish conceptually between mobility and sedentism. She wrote, 'traditionally foragers are described in terms of mobility and agriculturalists in terms of sedentism' (Ogilvie, 2006, 153). Wickham-Jones remarked that while the concept of mobility is fundamental to most interpretations of the European Mesolithic, there is also no uniform definition of mobility or agreed ways of recognising it in the archaeological record (Wickham-Jones, 2009, 71). Individual scholars may define their own concepts of mobility, but these can overlap with other scholars' definitions of sedentism. Wendrich and Barnard suggested that 'mobility should be defined for each population separately according to very specific questions over a long period of time' (Wendrich & Barnard, 2008, 8-9). As Bernbeck wrote:

> 'One fundamental bias can never be treated adequately: written sources are the product of sedentary, almost invariably urban people who not only take an external standpoint when describing mobile populations but also tend to be socially and geographically distant from them.' (Bernbeck, 2008, 48)

Milner (2005) highlighted the way in which sedentism in prehistoric communities has been considered in terms of cultural evolution. She noted that archaeologists have focussed on communities becoming sedentary because 'it is often understood to cause dramatic changes in trade, territoriality, socio-political hierarchy and to lead to the development of agriculture'. Milner pointed out some of the challenges to the evolutionary sequence, both in relation to Mesolithic and Neolithic settlement organisation. She cited studies demonstrating that in some cases Mesolithic communities may have had permanent or semi-permanent occupations and that Neolithic people may have been much more mobile than previously expected. In relation to this, Milner cautioned that while these particular studies questioned the concept of sedentism in the past, they should not be interpreted as indicating a greater degree of sedentism in the Mesolithic or nomadism in the Neolithic (Milner, 2005, 32-33).

Although mobility has been more frequently defined, there is still no agreed determination of the delineation between a mobile population and a sedentary one, and many communities labelled as semi-sedentary or seasonally-sedentary might more appropriately be termed mobile or even semi-mobile or seasonally mobile. Kelly posited that because of the wide-ranging variations in mobility and because archaeologists have not understood the relationships between changing locations and material culture it has been difficult to

identify the differing forms of mobility. He extended that point to say 'this is especially true in defining and then detecting sedentism' (Kelly, 1992, 43).

Over the last fifty years, many of the previously held "certainties" about the Neolithic period have been discounted. It is now accepted that for at least part of the Neolithic in several regions many communities were in fact fairly mobile. The use of ceramic technology, for example, once a benchmark for a sedentary society, is now understood to have been used by communities that were pragmatically mobile. When comparing the production of ceramics in ethnographically documented communities, Rafferty found that 42.5% of the non-sedentary communities produced them, whereas 79% of the sedentary groups did (Rafferty, 1985, 133).

It was noted by Pluciennik that whereas many earlier models had regarded the transition to the Neolithic as an instantaneous phenomenon, some of the more recent models used for study of the transition to agriculture have regarded the transition 'as a process occurring in space and time, rather than as an event – "the arrival of the Neolithic" – which informed so many previous views'. These recent models placed the population that was using Mesolithic assemblages as active participants in the process. Pluciennik also commented that these newer models still regarded the transition as a one-way process and as always arriving at the same situation (Pluciennik, 1998, 68-69). Similarly, the domestication of crops and animals was not instantaneous, and McCarter, too, suggested that this should also be regarded as a process rather than an event, taking more than 3,000 years for many initial Neolithic communities to change from foraging to full-scale agriculture (McCarter, 2007, 17).

There are many changing positions and opinions in scholarship. One example is consideration of the Neolithic of the British Isles, with greater emphasis now being given to mobility. The change demonstrates that if the relationship between sedentism and agriculture is reconceptualised, many other positions will also change. Similarly, the Basket Maker culture people of the North American southwest, who are also associated with agriculture, are not now thought of as necessarily being sedentary (Kelly, 1992, 51). In discussion of the Mesolithic-Neolithic transition in Europe, Pluciennik noted 'in any model, there is a danger of subsuming variability and simplifying complexity'. He continued with the caution that 'this huge span across time and space should warn us that it is dangerous to define the Neolithic in any way except on the most minimal grounds' (Pluciennik, 1998, 75).

A change occurred in academic thinking about hunter-gatherers and their lifestyles in the mid-20th century, particularly following the 1966 "Man the Hunter" Conference. There has been considerable scholarship in the last sixty years on the subject, especially on what are considered to have been the more complex hunter-gatherer societies that exhibited less residential mobility, but there has been somewhat less in-depth research on the actual processes involved in the final settling down of previously mobile communities. Price did, however, note that research on hunter-gatherer societies was slowing down by the end of the 20th century (Price, 2002, 413). In 1996, Arnold highlighted what she described as 'problems of "agricentrism" ' and noted that 'sociopolitical complexity needs to be rigorously and consistently discussed in the light of fresh data from both hunter-gatherer and agricultural groups'. She reported that in the previous decade, archaeologists had repeatedly shown that some hunter-gathering societies had reached simple 'chiefdom' levels of sociocultural complexity with permanent hierarchical organisation both in the New World and the Old World (J. E. Arnold, 1996b, 3).

Pluciennik noted that at the present time there are major differences between scholars researching hunter-gatherers and those focusing on urban or state societies, although there was no archaeological reason for this particular division. He wrote that one of the more subtle consequences of this was the way in which the lithic component of the archaeological record is little considered once ceramics are present, possibly because they are more highly valued as representing progress, civilisation and agriculture (Pluciennik, 2005, 16). There are also possible issues of status, with some researchers wanting to be associated with research on people thought to have been sedentary.

That much of the terminology which is used in relation to the Neolithic and the time periods surrounding it is outdated has been suggested by Watkins (2013). He wrote that rather than dividing the neolithicisation processes into phases, particularly in the Near East, it should be replaced with a series of neutral labels. This would remove the artificial distinctions between, for example, the Epipalaeolithic and the Neolithic. Watkins also suggested that Childe's constructs of archaeological culture and the 'Neolithic Revolution', with an almost immediate change from hunting and gathering to agriculture and with the village as the basic social unit, needs to be replaced in current scholarship with consideration of the communities who built and inhabited settlement sites and their wider networks of interaction over a much longer period of time (Watkins, 2013). This could go some way towards removing ambiguity, as the process is not simple, nomadic → sedentary, but rather a changing process, with more ↔ less nomadic and more ↔ less sedentary residential patterns.

Scholars have recognised that according to their definitions, becoming sedentary has not always been a one-way process. However, once communities have become sedentary, even if they revert to a more mobile lifestyle they understand what is involved in settling down and know how to do it again, or can observe other communities around them who are sedentary. There were phases into and out of sedentism for some societies, which have been covered by many scholars, including, for example, Habu (Habu, 1996), Kohl (Kohl, 2002), Boyd (Boyd, 2006), Gibson (Gibson, 2006), Garcea (Garcea, 2006), Walde (Walde, 2006) and Wengrow (Wengrow, 2010). Marshall suggested that once scholars begin to consider the adoption and abandonment of sedentism as a two-way process, they might consider the archaeological evidence more carefully, with the potential to identify sedentism more frequently, or perhaps differently (Marshall, 2006, 159).

1.3 Does a Phenomenon exist under the label "sedentism"?

Given this ambiguity, one option might be to presume that nothing happened, and there was in fact no consistent phenomenon to investigate and that a transition to sedentism had not occurred and did not exist. If this were the case then the answer to the quandary would be that the ambiguity and the self-evident statements are simply a corollary of the absence of a consistent phenomenon. And this thesis could halt. However, that way out of the task and out of the scholarly quandary is not an option, because the archaeological record contains a recognisable phenomenon in settlements and their increase in average size that is clearly discernible, which took place in different parts of the world at different times over the past 10,000 years. It predates the formally recognised initial, take–off in the size of the first compact settlements which we conventionally label as urban throughout the world (e.g. Fletcher, 1995, 188). This pattern can be seen even in a graphical representation of the most basic data − the reported site sizes. Fletcher posited that there would be measurable growth of settlement sizes with the acquiring of new means of communication and interaction that enabled the long-term establishment of sedentary communities (Fletcher, 2004, xix), and this can be seen in the following graphs. Definite "take-off" points are apparent, showing the same sudden increase in site size within a small temporal span. Although these are, of course, only provisional indicators, they demonstrate that a massive phenomenon was occurring which involved one of the major changes − the site size increase that is usually considered to occur with sedentism. That does not mean it related in some simple way to what we are talking about when we use the term "sedentism", because scholars mean many things by that term, but the discussion does apparently relate to a major phenomenon that needs interpretation and clarification. The evidence supports the case that there is a phenomenon requiring

analysis and that the issue of how to comprehend the problems that have arisen in understanding this phenomenon are consequentially significant. It is not my purpose to explore the empirical information on the subject of these settlement size increases in further detail, as that would require a further thesis.

Changes in site size through time are shown here for some sites where size could be determined in North Africa, Israel, Jordan and Syria, Iran and Iraq, Anatolia, Peru, Mesoamerica, China and India, Pakistan and Afghanisan (Figures 1-8). Details of the sites and their sizes are shown in Appendix I. There are very similar "trajectories" in the charts indicating an increase in reported site size occurring at differing times in these different regions. Similar changes in site sizes through time can also be identified in other regions of the world (see Appendix I). Though sedentism may be a problematic label, the empirical evidence indicates that there was indeed a process taking place that needs explaining. The sedentism debate cannot, therefore be dismissed as a purely terminological issue. Asking how scholars have sought to define and explain sedentism is consequential and is necessary to enable us in due course to "see" the issue in new ways.

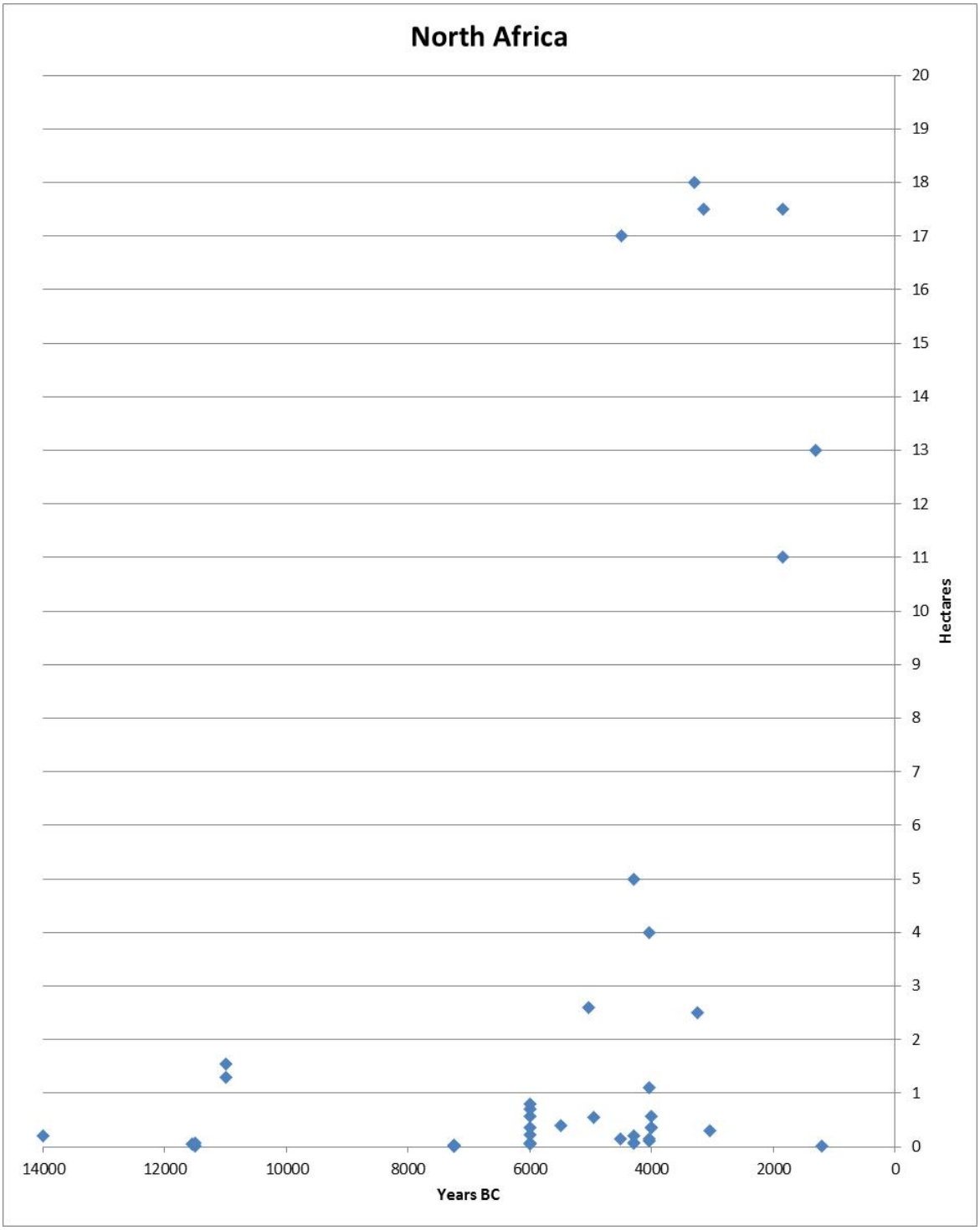

Figure 1 – changes in site size through time in North Africa. Details of sites are shown in Appendix I

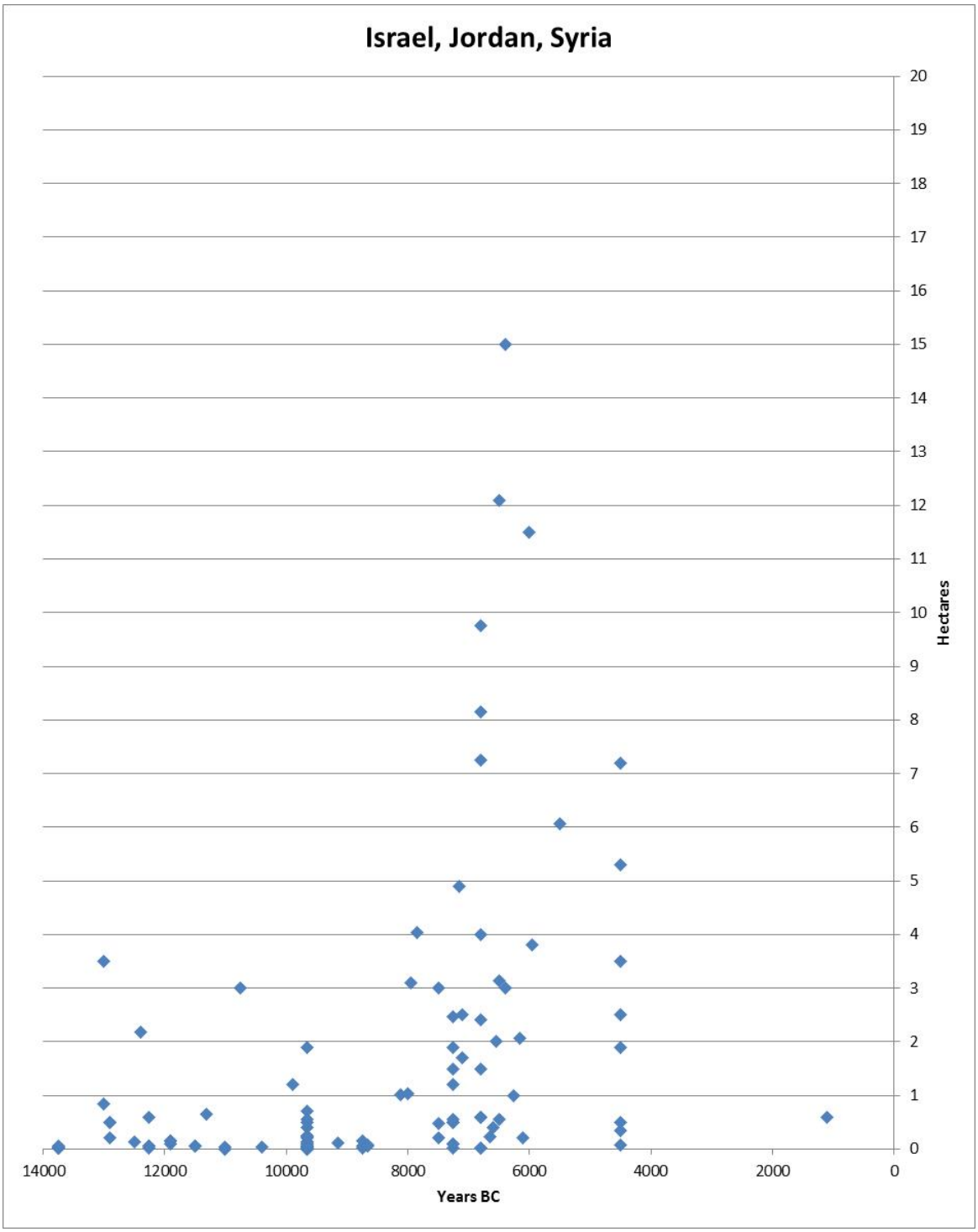

Figure 2 – changes in site size through time in the Israel, Jordan and Syrian region. Details of sites are shown in Appendix I

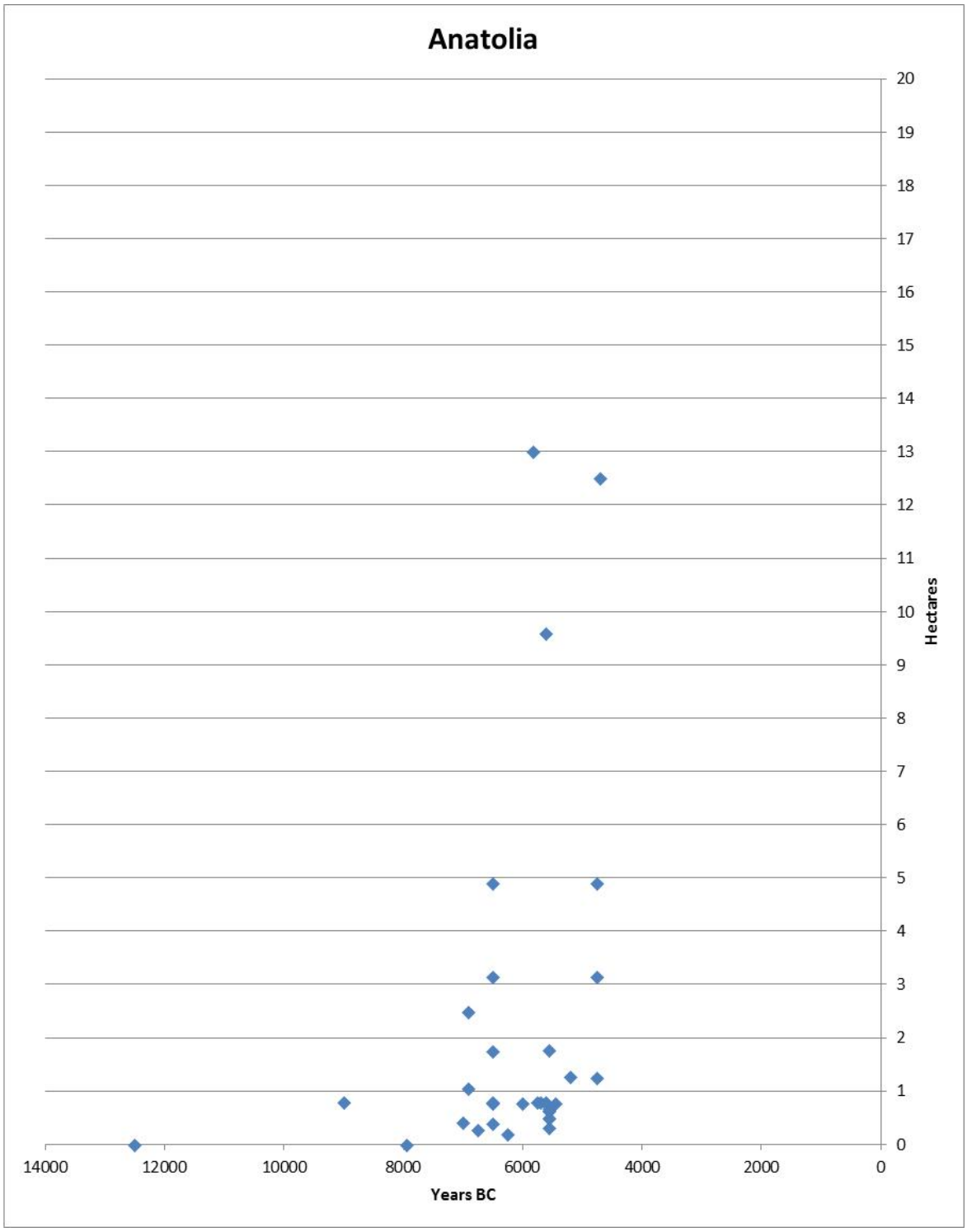

Figure 3 – changes in site size through time in Anatolia. Details of sites are shown in Appendix I

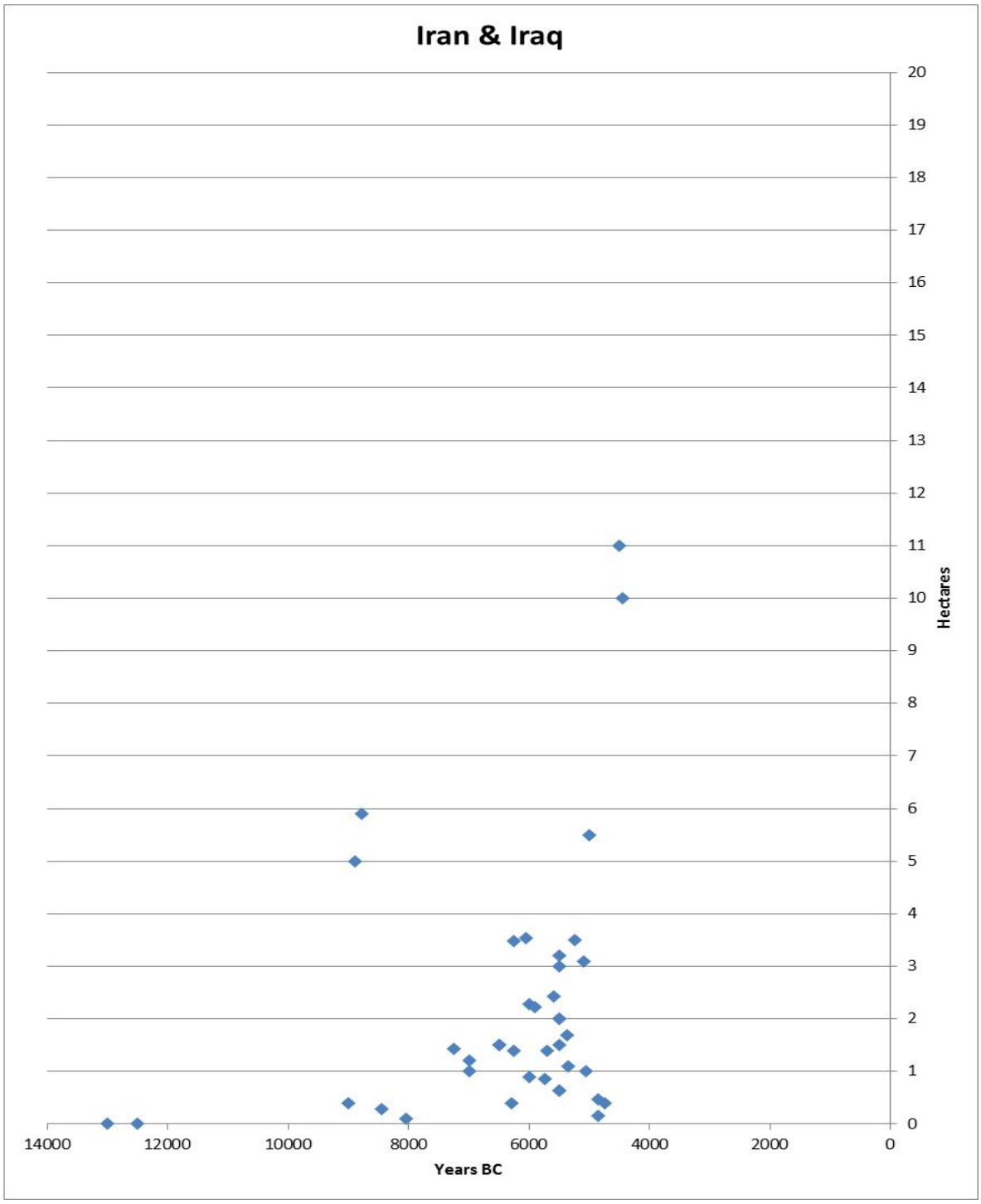

Figure 4 – changes in site size through time in Iran and Iraq. Details of sites are shown in Appendix I

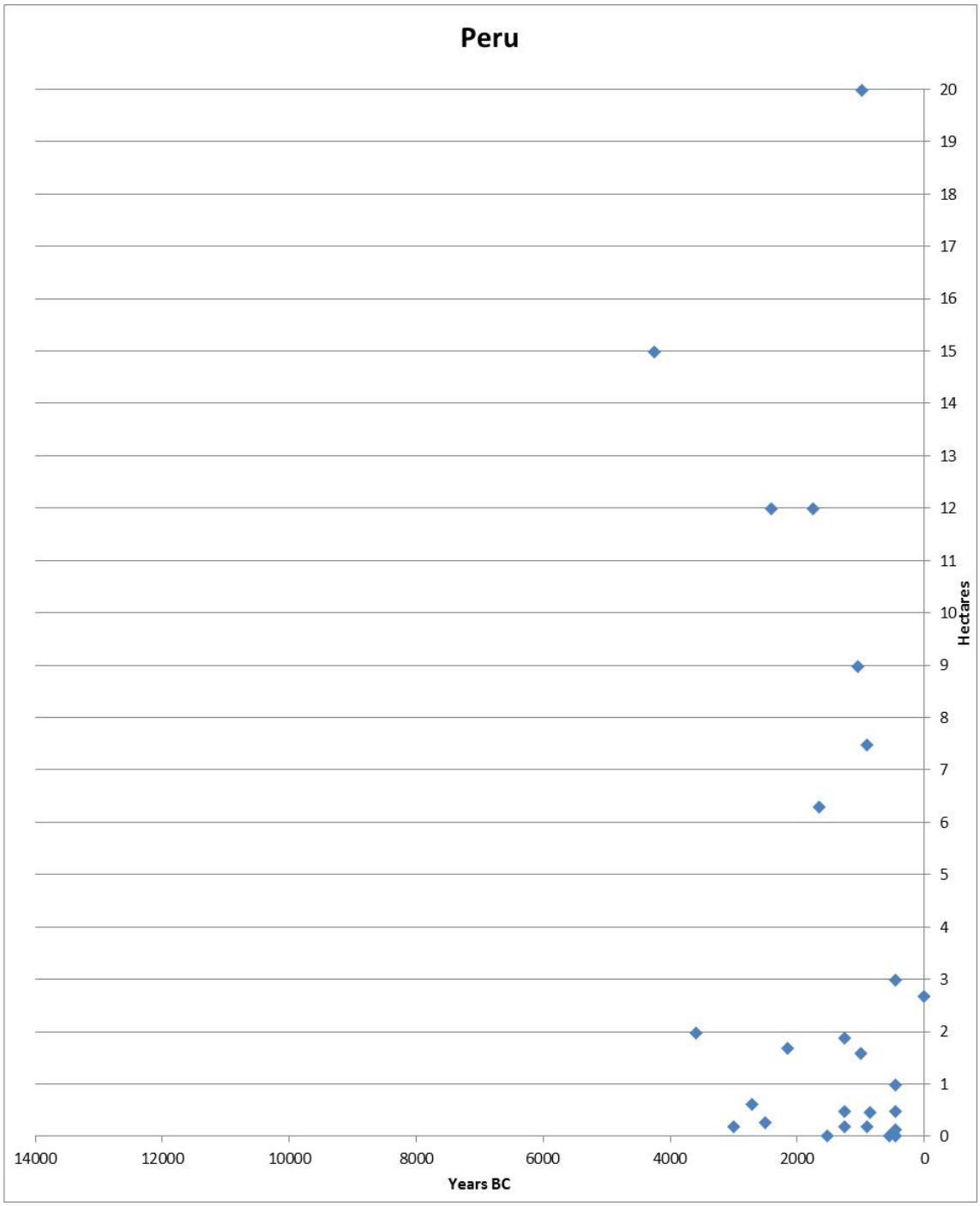

Figure 5 – changes in site size through time in Peru. Details of sites are shown in Appendix I

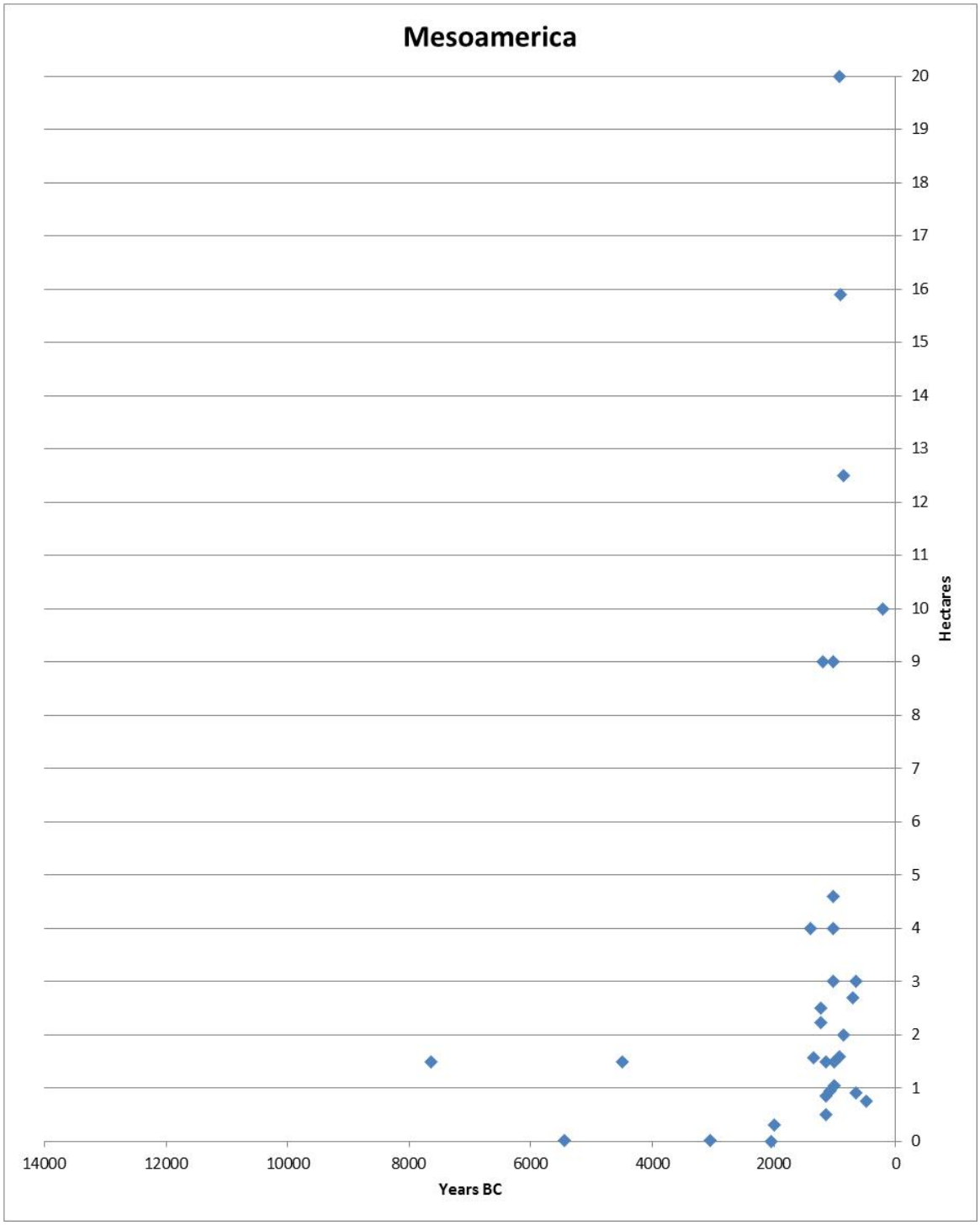

Figure 6 – changes in site size through time in Mesoamerica. Details of sites are shown in Appendix I

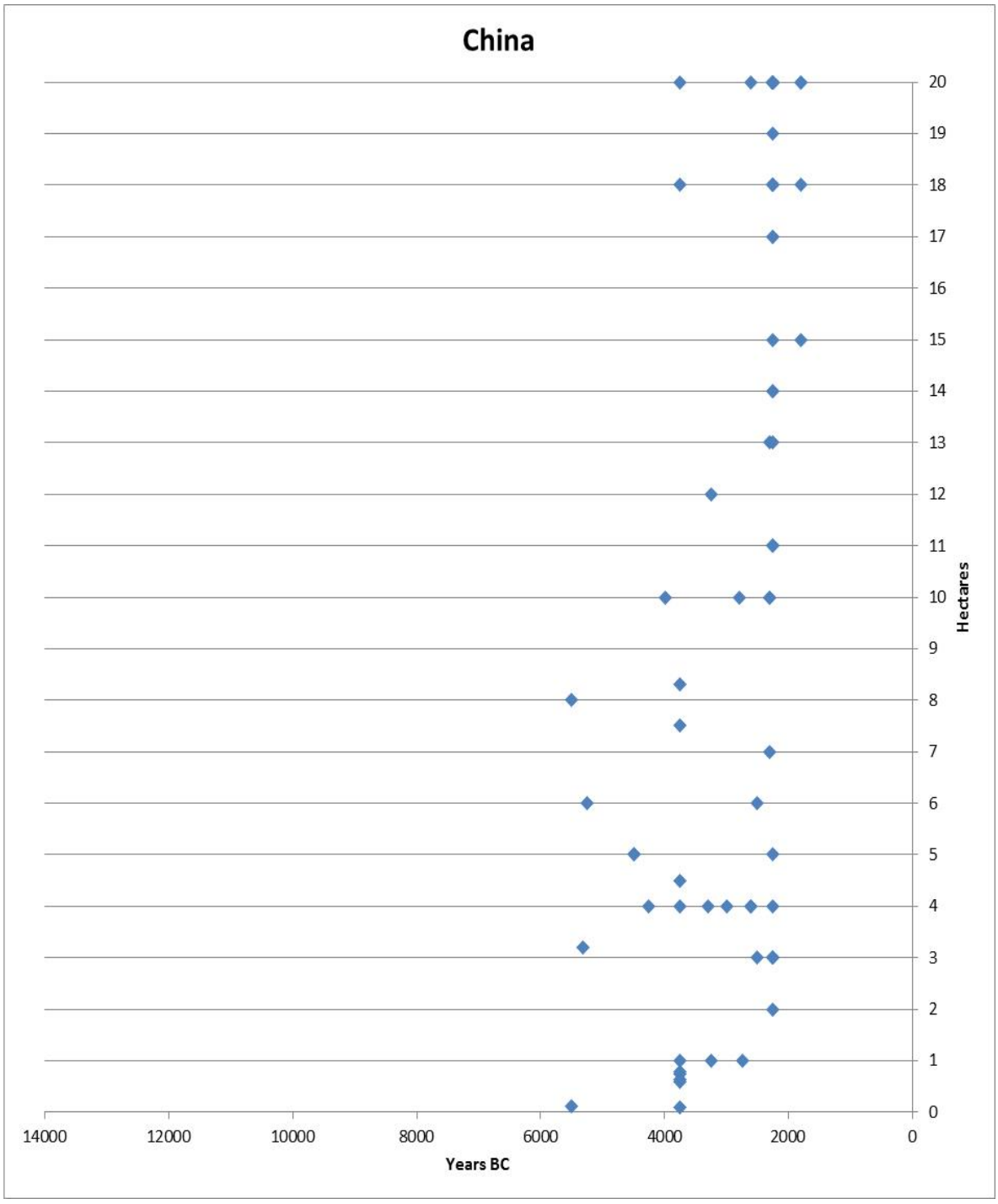

Figure 7 – changes in site size through time in China. Details of sites are shown in Appendix I

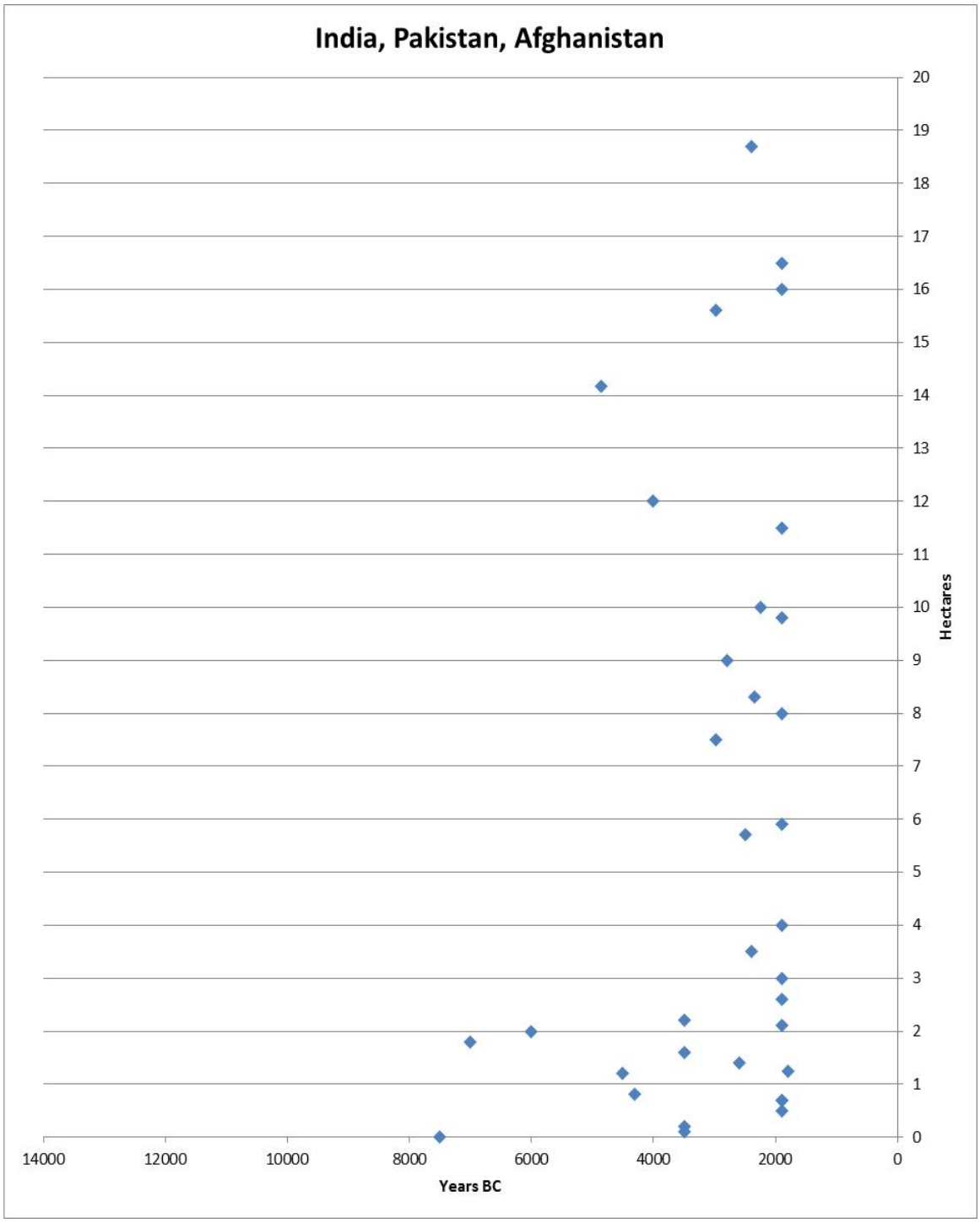

Figure 8 – changes in site size through time in India, Pakistan and Afghanistan. Details of sites are shown in Appendix I

1.4 The Significance of "Sedentism"

Sedentism is a fundamental issue because the presumed transition from a mobile to a fully sedentary lifestyle was patently such a major and important change in human behaviour which is considered to have happened at different times in different regions of the world. This premise is well accepted and is somehow disengaged from the analytic and definitional issues. The transition to sedentary living seems to have made a profound difference to the expansion of agricultural economies as Harris has argued (e.g. D. R. Harris, 2010), then to the development of urban life and to the exponential human population increases of the last 10,000 years. Within the last 10,000 years, apparently following a transition to sedentism in the majority of societies, humans have changed their mode of living from a species that for more than two million years is estimated to have aggregated generally in small groups of tens, with occasional groupings of hundreds and very rarely thousands of individuals, to a species that today sometimes live in aggregates of 25-50 million human beings or more.

As Daniel pointed out, humans have only lived a settled existence as food producers for about one-sixtieth of *Homo sapiens*' existence (Daniel, 1962, 164). Gamble wrote that 'sedentism is regarded as a turning point in human cognitive, symbolic and social life' (Gamble, 2007, 265). Despite the significance and ramifications of this turning point, considerable ambiguities remain in the definition of sedentism and how to identify it in the archaeological record. The ways in which scholars continue to refer to it are very varied and inconsistent. Explanation itself becomes ambiguous and problematic since the use of non-equivalent phenomena may be incorporated in the various claims for sedentism. There are obviously many causes of this ambiguity, but an important factor is this lack of a clear and precise definition of the terminology. Different scholars use different benchmarks in their claims, and while this situation continues, so will the ambiguities.

Notwithstanding the scale and importance of the phenomenon of becoming sedentary there has, with a few notable exceptions, been relatively little rigorous theorising on the subject compared with other major changes in human behaviour such as the beginnings of agriculture or the development of urbanism. As an example, although Johnson's popular textbook-style book *Archaeological Theory: An Introduction*, is mainly concerned with archaeological thought and practices, its index has no references to mobility, sedentism, urbanism, settlement archaeology or even hunter-gatherers, and the entry for seasonality refers to two paragraphs in the chapter on Archaeology and Darwinian Evolution (Johnson, 2010, 173-174). In her introduction to the 2006 issue of *World Archaeology*

devoted to sedentism in non-agricultural societies, Marshall described sedentism as being a process, not a switch to be turned on or off. She wrote 'When understood as a process, sedentism becomes a complex phenomenon that demands investigation in its own right' (Marshall, 2006, 158). To date, however, such investigation of sedentism *per se* as a major and complex change in human behaviour has been limited.

The German Archaeological Institute has a Research Cluster with the title 'From sedentariness to the complex society: settlement, economy, environment'. They have organised several conferences related to sedentism, but as yet there are few publications available in English. Their stated aims of this research cluster include:

- 'The need to undertake a comparative analysis of the general circumstances of sedentarization in the highly diverse natural and cultural environments of the Old and New World
- New scientific approaches might also enliven the debate about the beginnings of the Neolithic in the Near East and ancient Europe
- Contribute to a critical re-evaluation of existing models and hypotheses'

Questions raised include:

- 'How strong was the ecological influence on man's cultural development, especially with regard to sedentarization and the adoption of a productive mode of economy?
- What induced people to abandon foraging, practised for thousands of years, in favour of agriculture?'

In their rationale they conclude that 'This is the only way of arriving at an enhanced understanding of the matter' (Benecke, Parzinger, & Reindel, 2014). If they can achieve their aims in relation to the transition to sedentism, it would certainly assist in removing some of the cloudiness surrounding the topic.

Renfrew posited that:

> 'the first great revolution or transition in the experience of our species was the sedentary revolution. It was then that humans entered into a series of new relationships with the material world'.

During this transitional period humans not only began to build houses, shrines, tombs and monuments, but also developed new technologies and new systems of trade and economy. As Renfrew pointed out, the majority of these changes were achieved before the development of writing (Renfrew, 2003, 115). The time frame for, and the mechanisms by which this sedentary revolution took place were given only minimal consideration by scholars until the 1960s and the archaeological signatures of the transition continue to be a topic of inconclusive debate.

Renfrew has argued that one of the dilemmas in archaeological theory is that it provides little understanding of the processes of cultural change, or why, when and where such changes took place. He posited that many of the changes, particularly those following new concepts of values, only happened with the development of sedentism (e.g. Renfrew, 2012, 140). Gamble noted that, while he agreed with Renfrew's proposition, he did not agree with the thesis that there had been 'an exponential change in the rate and scale of cultural and symbolic life with sedentism in the Neolithic'. Gamble argued that there had not been a different cognitive 'mind-set' before the Neolithic, which Renfrew's thesis would presume, and questioned whether sedentism was in fact the evidence for cognitive change in prehistory (Gamble, 2004, 85).

Few scholars have questioned why people began to settle down, although some have considered the ramifications of such settling. Evans (2004, 97), for example, set down a few of the consequences of a settled lifestyle, and listed some advantages and disadvantages of the change. She noted that increases in social complexity depended on sedentism and its concomitant provision of crop security and ownership of property and land rights. Social relations changed with sedentism, leading to self- or family- interest, sometimes at the expense of the good of society as a whole. Evans listed the advantages of settling down as:

> 'First, the costs of frequent moves are eliminated; food and goods can be accumulated against lean times. The weak and infirm are not subjected to the stress of dislocations. Labor that is invested in establishing or improving living facilities and croplands is repaid over the years.'

Countering this, Evans listed some of the apparent costs of sedentism. The first is the difficulty in finding prime locations, with abundant and permanent resources nearby and which are easily defensible. Living in one place is also less healthy than mobile foraging, with diets more prone to nutritional deficiencies and living in close contact enables the spread of diseases, including those from domesticated animals. Population concentration also increased the problems caused by polluted water, poor sanitation and shortfalls in food supply. Another factor, which Evans refers to as 'the destructive power of human rage', occurs when larger populations cannot be managed by the elders of a community. Sometimes this kind of conflict could lead to part of a village moving away, perhaps taking much of the community's wealth with them (S. T. Evans, 2004, 97-98).

Evans also pointed out that:

> 'the transition from mobile foraging to sedentism and domestication results from a long series of mostly minor choices and innovations designed to increase efficiency and minimize risk in exploiting, or even controlling food sources'.

In southwest Asia, the transition to sedentism is considered to have preceded plant domestication, with communities beginning to settle down in an environment with high-protein grains. Evans hypothesised that this probably led those communities to put off moving for longer and longer periods, eventually leading to year-round sedentism (S. T. Evans, 2004, 77-78). Evans also posited that 'sedentism is seductive to humans' as the opportunity to remain in one place with expectations of living in greater comfort led community after community to give up mobile foraging lifestyles and establish permanent settlements (S. T. Evans, 2004, 33).

Historically an underlying assumption regarding sedentism has been that it was the high, or end, point of cultural evolutionary development. There is a still a widely-held view that it is a good, rather than a neutral thing, again a residual position from the previous linear progress paradigm. There are many commonly-held views on what may be termed sedentism, or as part of the process of sedentising, many of which have not been conclusively demonstrated to relate only to communities which are residentially stable. They include:

- The purported existence of universal archaeological markers of sedentism
- The fallacy of improvement – 19th century concepts of the law of progress
- That until at least the mid-20th century hunter-gatherers were assumed to have been ignorant and stupid
- Hunter-gatherers were seen as "doing nothing and not changing"
- Family groups continually moving apart stopped the transmission of knowledge in mobile communities, which is why they did not progress
- "Complex" hunter-gatherers were necessarily sedentary
- That there is always a progression from savagery (mobile hunter-gatherers) through barbarism (sometimes termed pastoralism) to civilisation.
- When people came into contact with herding animals they adopted a pastoral lifestyle (e.g. Turgot 1750).
- Developing pastoralism/agriculture led to more free time
- Property requires defence
- Durable huts indicate sedentism
- Rectilineal architecture equals sedentism
- Pottery is an inherent marker of sedentism (particularly prevalent in the 19th century)

- The nature of complexity in archaeological thought
- The conflation of mixed-plant agricultural and animal herding as agropastoralism

1.5 Conclusions

There are numerous different concepts and several different referent points around which the debate concerning the initial transition to sedentism is taking place. However, to date there are no secure or consistent connections amgonst them. There are no stabilised, agreed or paradigmatic theories concerning sedentism, nor agreed reference points, despite it being a major change in human behaviour. Agreement is lacking about how to define or recognise sedentism, both archaeologically and conceptually. Scholars have attempted to retrodict, using observed communities from the recent past, to reconstruct residential changes which took place before recorded history. This approach is not a satisfactory way to address the issue. Similarly, the use of other forms of ethnographic analogy and comparisons is not an appropriate solution. In order to conceptualise what sedentism is and how it could be reliably recognisable in the archaeological record, the issue of material and social correlates of sedentism will need to be rethought, as is discussed in Chapters 8 and 9.

The effects of societies becoming sedentary were far-reaching. As Bandy and Fox noted in the Preface to *Becoming Villagers: Comparing Early Village Societies*:

> 'When humans became villagers, at various times and in various places, they laid the foundation for all subsequent forms of human sociality, forms that were completely without precedent in human history' (Bandy & Fox, 2010b, viii)

The graphs in Figures 1-8 showing the changes in site size through time demonstrate that there was a distinct increase in settlement size within a compressed temporal range in different regions of the world. These shifts occurred in the time spans and regions in which "sedentising" is said to have occurred, so there is some distinct phenomenon or phenomena requiring attention.

In order to demonstrate how some of the ambiguities and misconceptions have arisen, and what has led them to continue, the definitions and explanations need to be placed in the context of the history of the intellectual traditions of scholarship about the initial transition to sedentism. Although ideas related to the unilinear stages of progress for humans had been proposed earlier, the Enlightenment scholars and those who followed them set in place a model which was rarely questioned until recently. This largely unquestioning acceptance of the stage model meant that little consideration was given to

the actual processes involved in the different lifestyle changes in prehistory and to the timescales involved in those changes. The inconsistencies, ambiguities and vagueness which have pervaded the scholarship in the past, together with a lack of agreed definition of the terminology, continue to the present day. Sedentism is patently a fluid concept, and the lack of consistent definitions of a sedentary lifestyle and consistent explanations of a shift to sedentism are central issues whose presence requires explanation.

Chapter 2: Opinions and Problems in the Study of Sedentism

'Perhaps a key problem in using the word sedentism is that it is used by different disciplines to describe different things' (Milner, 2005, 36)

2.1 Introduction

In 2004, Thomas commented that the philosophical stage theory histories, particularly from the Enlightenment period, were constructed without any grounding in material evidence, but they had nevertheless provided the basis for Thomsen's Three Age System, the first such use in archaeology. While noting that historical change had been considered to be directional, he points out that until the start of the 19th century nature had generally been considered to be inert, and therefore past human progress had been considered to be necessarily contingent on an escape from the 'state of nature'. Thomas posited that this dichotomy and the progressionism it generates still affect archaeology, particularly in the debates over the origins of anatomically modern humans, the origins of the human mind and the origins of agriculture (Thomas, 2004, 25).

Until the 1950s and early 1960s, the "origins" of agriculture and the transition to sedentism were generally viewed as part of a progression that took place in prehistoric communities as they moved from "savagery" to "barbarism" and then to "civilisation", and it seems to have been considered hardly necessary to address the issue in detail. The development of the progressivist viewpoints derived from the opinions of scholars in the 18th and 19th centuries, and will be discussed in more detail in Chapters 3 and 4. Only in the mid-20th century, with the development of the concept of "affluent foragers", did it become apparent that the hunting and gathering lifestyle was in fact much less difficult, and indeed more advantageous, and early agriculture much more laborious, than earlier scholars had assumed (e.g. the papers from the Man the Hunter Conference, Lee & DeVore, 1968). Following this, consideration began to be given to the ways in which communities had settled down, and sedentism began to be recognised as a problematic issue.

As noted in Chapter 1 (Kelly, 1992, 52), it is now recognised that agriculture does not necessarily require a permanent year-round residence. Halstead commented in 2005:

> 'It is clear from ethnographic counter-examples that neither agriculture nor the storage of agricultural products necessarily ties farmers to a fixed residence. On the other hand, the duration and timing, as well as scale, of habitation in a given

> locality plainly constrain the range of viable subsistence strategies. The distinction between year-round and seasonal habitation may be crucial, therefore, in modelling Neolithic subsistence activity, even at the fundamental level of relative dependence on cultivation, animal husbandry and foraging' (Halstead, 2005, 38).

The debate has expanded and major issues have been recognised, but no agreement has been reached. Before the 20th century, and even in some cases up to the mid-20th century, communities still living a mobile hunting and gathering lifestyle were almost automatically regarded by Western scholars as savage, or at least as barbaric, and towards the bottom of the human evolutionary chain. In the 19th century they were therefore viewed as worthy of interest because it was believed they showed what our earliest ancestors had been like. At the end of the 19th and beginning of the 20th centuries there was considerable interest in the work of anthropologists such as Spencer and Gillen (e.g. Kuklick, 2006) who were able to conduct original research among Indigenous Australians, as opposed to the second-and third-hand accounts on which much of the earlier scholarship had been based. However, such scholarship did not change the basic concept that all hunter-gatherer communities were at a lower evolutionary level than those living a settled life. The great change occurred with one of the major, highly innovative and comprehensive academic studies of modern communities still living a hunter-gatherer lifestyle – the Kalahari Research Project, lasting from 1963 to 1976. This was established to gain insights into the evolution of human behaviour and ecology, the way past habitation sites were used, the economics of hunter-gatherer food strategies and the effects of becoming more settled and developing agriculture (Lee, 1979). What it did was to transform how we understood hunter-gatherer economies and society (see Lee & DeVore, 1976, for example). Attention became more focussed on the subject of hunter-gatherers and the qualities of their way of life, while the transition to sedentism became an interest of the New Archaeologists in the 1970s and 1980s. This interest and scholarship declined somewhat in the 1990s and early 2000s. Whilst there have been many articles and books written about sedentism since the 1960s, there has been no apparent clarification of the ambiguities nor the introduction of comprehensive new explanatory theories other than locally relevant and specific viewpoints.

The transition to a sedentary way of life is usually thought of as beginning with small fixed villages which eventually become inhabited year round, evolving into larger villages, cities and eventually to large urban centres. But this linear convention is problematic, because even urban societies can be mobile. Prior to the establishment of Addis Ababa as Menelik II's capital in 1892, the urban capital of Ethiopia had moved

across the landscape in the dry season, with the population dispersing in the wet season. The population lived in tents or built temporary shelters at each place where the capital halted. After it stopped moving at the current location of Addis Ababa, the tents and shelters were eventually replaced by more durable structures, which retained for a while the configuration of the mobile residence pattern (Fletcher, 1991, 405-410). Similarly, Kampala was a transient settlement in the mid-nineteenth century. The royal residence was usually situated near the northern side of Lake Victoria but between 1860 and 1885 it moved three times, and the settlement around the palace compound had a low population density (Fletcher, 1998, 117). Therefore the convention of a simple directional sequence is not adequate, as can also be seen from the case of the complex hunter-gatherers, which is discussed in Chapter 8.

This chapter will outline some of the basic problems of dealing with the concept of sedentism, reviewing the ambiguity caused by the lack of an agreed definition of the terminology, the problems of self-evident propositions, and the purported indices of sedentism. The implications of these issues, including the problem of the self-evident, will be discussed further in Chapters 8 and 9, following the historical overview of opinions on sedentism and sedentising. It will also provide an overview of some of the other issues relating to sedentism and purported archaeological markers of sedentary communities.

2.2 Definitions of sedentism

Definitions of sedentism and the associated issue of the Neolithic raise ongoing problems**.** There is a continuing ambiguity in scholars' definitions of the terms "mobile" and "sedentary" and the variations on these terms, with as yet still no universally accepted definition of what constitutes sedentism or a sedentary community. Curiously, the word sedentism itself is rarely included in standard dictionaries, including archaeological ones. There are several variations of the term which are included, as shown in the following table.

Term	**Source**	**Reference**	**Quotation**	
No reference to sedentism	*Archaeology: The Key Concepts*	(Renfrew & Bahn, 2005)		
No reference to early villages	*Archaeology: The Key Concepts*	(Renfrew & Bahn, 2005)		

Term	Source	Reference	Quotation	
Settlement pattern studies	*Archaeology: The Key Concepts*	(Renfrew & Bahn, 2005)	Brief mention under Processual Archaeology section	
No reference to sedentism	*Oxford English Dictionary Online*	(Press, 2015)		
Sedentarization	*Oxford English Dictionary Online(Press, 2015)*	(Press, 2015)	'the settlement of a nomadic people in a permanent homeland or place of habitation'	
Sedentary	*Oxford English Dictionary Online*	(Press, 2015)	'remaining in one place of abode; not migratory'	
No reference to sedentism		(The Macquarie Dictionary Online, 2012)		Australia's official dictionary
Sedentary	*The Macquarie Dictionary Online*	(The Macquarie Dictionary Online, 2012)	'Chiefly Zoology, is 'abiding in one place; not migratory'	
No reference to sedentism	*Dictionary of Archaeology*	(Bray & Trump, 1970)		No references to sedentism, mobility, hunter-gatherers or settlements, only tells
Sedentism	*The Oxford Companion to Archaeology*	(Fagan, 1996)	'See Agriculture'	
Sedentary societies	*Dictionary of Anthropology*	(Barfield, 1997)	Refers readers to definitions of agriculture, evolution, intensification and pastoral nomads	
Sedentariness	*Dictionary of Concepts in Archaeology*	(Mignon, 1993)	3 pages of definition	

Term	Source	Reference	Quotation	
No reference to sedentism	*Concise Oxford Dictionary of Archaeology*	(Darvill, 2008 (2nd edition))		
Sedentary lifestyle	*Concise Oxford Dictionary of Archaeology*	(Darvill, 2008 (2nd edition))	'A residential pattern based around a single main settlement rather than involving moving camp at regular intervals'	
Settled populations	*Handbook of Archaeological Theories*	(Ames, 2008, 493-494)	'settled populations have been widely seen as a proximate cause or a necessary precondition to the evolution of social complexity'	Did note that many aspects of complexity appear in pastoral societies
Sedentism	Wikipedia	Definitions have changed since originally written	'the transition from nomadic society to a lifestyle that remains in one place. Essentially, sedentism means living in groups permanently in one place'	Short entry first written September 2005, with more than 155 amendments to September 2015

Table 1 – Definitions of sedentism

The much-used textbook *Archaeology: Theories, Methods and Practice* has few references to sedentism, and there were some changes between the Fifth and Sixth editions. There is no longer an entry for sedentism in the index to the Sixth edition, whereas there were six notations in the Fifth edition. In the section on 'The Emergence of Identity and Society, the Fifth edition refers to 'the onset of sedentism' (Renfrew & Bahn, 2008, 223), whereas the Sixth edition refers to 'the onset of sedentary ways of life' (Renfrew & Bahn, 2012, 214).

2.3 Ambiguities and Inconsistencies

Classifications of "sedentary" range from communities which never move or move only once every one or two generations through to settlements which are only occupied during some seasons of a year or for less than any one annual cycle. There are many references to "semi-sedentary" or "seasonally sedentary", 'moving towards sedentary', 'near sedentary' or 'significantly sedentary' communities, which other scholars would regard as still being mobile communities. The use of such terminology can mask important behavioural attributes of what were effectively still mobile communities. Fletcher has suggested that:

> 'we should perhaps begin to regard mobility as the broad, prevalent class of residential operation over the past several thousand years and define sedentism strictly as the comparatively rare permanent sedentism of the enduring, agrarian villages and towns familiar from regions such as Europe, South West Asia, India and China' (Fletcher, 1998, 120).

One of the few precise and unambiguous definitions of settlement duration was proposed in 1954, by Müller-Wille:

- *Ephemeral* settlements of a few days duration
- *Temporary* settlements of several weeks duration
- *Seasonal* settlements of some months duration
- *Semipermanent* settlements of some years duration, probably 5-30 years
- *Permanent* settlements lasting for several generations (Muller-Wille, 1954, esp. 156-158)

Müller-Wille posited that the houses or huts in the semi-permanent category would have been constructed from something stable, but that they were usually abandoned within 8-15 or even 20-30 years, and that within a generation a settlement could have moved once or twice (Muller-Wille, 1954). Butzer commented in 1971 that Müller-Wille's settlement categories could not be equated with economic traits or cultural levels but that 'consideration of these criteria in archaeological evaluation can be rather useful' (Butzer, 1971, 404-405).

In a 1955 seminar, Beardsley and colleagues identified seven primary types of community patterning forming a sequence from extreme mobility to complete sedentism, associating them with a move from cultural simplicity to complexity. These patterns, applying in both the ancient and modern worlds, were named as free wandering, restricted wandering,

central-based wandering, semi-permanent sedentary, simple nuclear centred, advanced nuclear centred and supra-nuclear integrated (Beardsley et al., 1956, 135). The distinctions between these different types do not appear to have been taken up by later scholars.

In 1967 Murdock published part of his Ethnographic Atlas in *Ethnography*. In this he categorised various characteristics of known contemporary non-industrialised societies. In his column for Settlement Pattern he distinguished between:

- 'fully migratory or nomadic bands
- separated hamlets where several such form a more or less permanent single community
- neighbourhoods of dispersed family homesteads
- seminomadic communities whose members wander in bands for at least half of the year but occupy a fixed settlement at some season or seasons, e.g. recurrently occupied winter quarters
- semisedentary communities whose members shift from one to another fixed settlement from which a substantial proportion of the population departs seasonally to occupy shifting camps, e.g. during transhumance
- compact and relatively permanent settlements, i.e., nucleated villages or towns
- compact but impermanent settlements. i.e., villages whose location is shifted every few years
- complex settlements consisting of a nucleated village or town with outlying homesteads or satellite hamlets' (Murdock, 1967, 159).

Although these classifications relate to ethnographically collected information, they are comprehensive. Similar classifications could also be applied to prehistoric communities, which, with adaptation, could provide a basis for analysis of the residential practices of those communities.

Kelly noted Beardsley and colleagues' 1956 four step categorisation of hunter-gatherers and Murdock's 1967 ethnographic categorisation of people as fully nomadic, semi-nomadic, semi-sedentary and fully sedentary. He noted that although some archaeologists do write about a continuum from mobility to sedentism, many consider communities as simply either mobile or sedentary or use variants of Murdock's schema (Kelly, 1992, 44).

In 1989, Kent observed:

> 'Despite previous discussions of sedentism … the concept remains ambiguous. There is sometimes a failure to recognize a basic semantic difference between the terms mobility, sedentism, and nomadism.' (Kent, 1989a, 2)

She expanded on this point with the following definitions relating to her particular study:

> 'Nomadism is the movement of a group on a landscape and sedentism is the lack of movement. Mobility is simply the movement of a group (not a camp) through space. Nomadism and sedentism, then denote the amount of movement or mobility involved. There are different degrees and types of nomadism, as noted by Binford (1980), and of sedentism, as noted by Vickers (1989). Nomadism and sedentism represent the extremes of the mobility continuum. Whether groups whose mobility patterns fall between the two extremes are classified "semi-nomadic" or "semi-sedentary" is, in my opinion, usually rather arbitrary.' (Kent, 1989a, 2)

As an example, Kent used the term 'semi-sedentary' to refer to the Amazonian Siriono 'because they are seasonally sedentary during the dry part of the year'. She wrote that she used that classification to identify that they were neither totally nomadic nor completely sedentary, spending about six months as nomadic and six months as sedentary each year (Kent, 1989a, 2).

Bar-Yosef and Belfer-Cohen agreed that the definition of sedentism is not simple. They used ethnographic examples to demonstrate ways in which people in the Near East with permanent houses and storage facilities actually moved seasonally, despite considering themselves sedentary and their settlements as being the permanent home of the group. Discussing the adoption of agriculture and the concomitant hypothesised increase in sedentism in the Balkans in the early Neolithic, Thissen posited that 'it might be better to characterise the early Neolithic commitment to land in terms of semi-sedentism'. He theorised that the sites that had been discovered in that region might be only part of the total settlement system of the time. Thissen suggested a tentative definition of the Starcevo-Cris society, in particular, as complex hunter-gatherers who may have practised small-scale horticulture and animal husbandry. He also noted that the numerous pits in their sites could have been storage facilities, rather than the usual interpretation as dwellings (Thissen, 2005, 72).

Kaner defined sedentism as 'the occupation of a particular location for over a year by the same residential group' (Kaner, 2003, 1), yet Kent posited that no society, even today, can be classified as completely sedentary if the definition of a sedentary community is that its members all reside in one location for twelve months each year. She suggested two types of nomadism and sedentism – nomadic groups who have or those who do not have permanent base camps and sedentary communities who leave their base for short time periods and those who live permanently in one location. Kent used stays of at least six months by the whole group in one location as a delineator, regarding them as

practising permanent sedentism, even if some of the group left for seasonal absences at other times (Kent, 1989a, 2).

Some scholars only use terms such as sedentary to refer to communities towards the end of the transition from mobility, while others include communities which are more mobile. Rafferty (Rafferty, 1985, 116) and Kelly (Kelly, 1992, 49), for example, follow Rice's 1975 definition of sedentary settlement systems as 'those in which at least part of the population remains at the same location throughout the entire year', while Edwards defines sedentism as 'a system in which the greater part of the population of a community resides perennially at one settlement' (Edwards, 1987, 316). Kelly pointed out that definitions of sedentism are often made up of a number of aspects of seasonality and mobility, leading to a tendency to ignore the continuum of change from a mobile lifestyle to a sedentary one (or vice-versa) and to regard societies as either mobile or sedentary (Kelly, 1995, 148-149). Hitchcock's definition of sedentism is a process 'whereby human groups reduce their mobility to the point where they remain residentially stationary year-round' (Hitchcock, 1987, 374). Odell defined sedentism as 'a relative term that includes both settlement permanence and settlement size, and recognizes that mobility may vary along several parameters at once'. He suggested a trajectory to permanent sedentism where societies stayed in one place for longer than their predecessors, with more of their population living in their base camps and/or with more restricted seasonal moves (Odell, 1998, 553).

Milner noted that not only was it difficult to show whether a community had been sedentary, 'the term sedentism is also vague in meaning'. She suggested using the term 'permanence', in the sense of 'occupation over many years (although not necessarily year-round occupation) and a spectrum of movements within a landscape' as an alternative (Milner, 2005, 36). Roberts' Glossary in his textbook-style book *The Holocene: An Environmental History* defines sedentism as 'living in one main place year round (as opposed to nomadism)', although he does not actually define nomadism (N. Roberts, 1998, 257). Sedentism and sedentary societies were discussed several times in McCarter's monograph *Neolithic* without precise definitons. However, the term "sedentism" (nor any variations thereof) does not appear in the 13-page glossary at the end of the work (McCarter, 2007).

There is often an assumption of an 'either/or' state of mobility or sedentism, or semi-mobile, semi-sedentary. Bernbeck pointed out that there has been no definition for groups that move settlements every three or four years, nor for groups where some members

remain at a settlement year-round while other members move to other locations for subsistence or other activities. Bernbeck contended that :

> 'such elements as partial mobility and spatiotemporal scales of mobility render any categorization based on a linear relationship between poles of mobile to sedentary, agricultural to nomadic, egalitarian to hierarchical unrealistically reductive' (Bernbeck, 2008, 47).

In 1973, Barth had posited that the different lifestyles of some Middle Eastern communities, operating between full mobility and complete sedentism could be divided into three major categories, based on their subsistence. These were summarised by Bernbeck (following Barth, 1973) as:

> ' "mixed economies" of herding and agriculture in which all households perform all subsistence tasks in a nonspecialized manner, with relatively low mobility; "integrated communities" with two segments, one focusing on herding, the other on agriculture; and "fully separate" herding and agricultural communities, whereby the sedentary and mobile communities have formal exchange relations'. (Bernbeck, 2008, 43)

Bernbeck made the point that since 1973 anthropologists had changed focus, with widely differing views of mobility. He noted that there was again, in the early 21st century, a growing 'sedentarocentrist' perspective, assuming that residential movement is undesirable for a community. Bernbeck has a section in his 2008 paper entitled 'The Mobile-Sedentary Dichotomy', noting that it has not only been archaeologists and historians, particularly those studying the Near East, but also cultural anthropologists who have written of 'almost unconnected mobile and sedentary groups' (Bernbeck, 2008, 43-45).

In the introduction to a *Current Archaeology* supplement containing papers from a 2009 conference which had discussed new findings and opinions on the origins of agriculture, Price and Bar-Yosef set down some definitions for their authors to use. Their definition for mobility and sedentism was somewhat minimal:

> 'Mobility and sedentism. These are relative terms that describe a range from completely mobile to completely sedentary. Sedentism is difficult to measure in the archaeology of the last hunters and first farmers, and this definition attempts to recognise that. It was suggested that the presence of commensals, such as house mice, and the seasonal distribution of plant foods within the same site may indicate an annual long-term occupation.' (Price & Bar-Yosef, 2011)

In 2010, Jordan and Zvelebil used the term ‘relatively sedentary for significant periods of the annual round’ in relation to hunter-gatherer communities living in resource niches which were rich and seasonally predictable. They noted that sedentary living and increased social competition could have led to the beginning of ceramic technology and they concluded that it was potentially compatible with ‘a wide range of hunter-gatherer adaptations, especially those that include some degree of seasonal sedentism’ (Jordan & Zvelebil, 2010a, 52).

In discussion of the archaeological evidence of the Early Neolithic in North China, Crawford (2006) wrote that whereas in Japan and Korea scholars assume that large sites with pottery are not nascent agricultural communities, Chinese archaeologists tend to assume the reverse, even with no supporting evidence. Crawford suggested that both positions are oversimplified. He noted that the first evidence of villages on the central loess plateau and in northeast China were clusters of pit houses, and wrote that although pit houses do not necessarily indicate year-round settlement, ‘they indicate substantial sedentism’ (Crawford, 2006, 82). Again, there is no definition of what ‘substantial sedentism’ might represent nor why these types of occupation structures should be linked to sedentism.

In addition to the lack of precise definitions of sedentism and mobility, there are similar ambiguities and a lack of uniform definitions in other studies of residential status, at both ends of the residential spectrum, as noted in Chapter 1. The term “village”, for example, has not been clearly defined. Finlayson and Warren pointed out that early villages, some of which may have not been permanently settled, have sometimes been discussed with an expectation of a particular form of social organisation. They wrote that current available evidence suggested that the early ‘villages’, even when sedentary, would be very different from today’s concepts of what constitutes a village. The larger, megasite PPNB settlements, for example, were up to 14 hectares in size, with populations potentially into the thousands (Finlayson & Warren, 2010a, 66-68).

Simmons and Najjar noted that after the initial excavation of Jericho, scholars had investigated a large range of Neolithic sites in the Near East, and had argued that a typical village was more along the lines of Beidha, at about 2 acres, than larger sites such as Jericho, at 10 acres. They also noted that recent research had led to new theses on the development of early Neolithic village life by recording the so-called mega-sites of more than 15 acres such as ‘Ain Ghazal, Wadi Shu’eib, Basta, Es-Sifiya and ‘Ain el-Jammam, without neglecting consideration of the smaller communities (Simmons & Najjar, 2007, 233).

Kelly highlighted the inconsistencies and ambiguities in different contemporary definitions and understanding of sedentism. He noted that the term is used to cover a range of settlement patterns, and that 'what one author labels sedentary, another may label semi-sedentary; some authors focus on settlement permanence, others on settlement size. Even where sedentism is defined, ambiguity may remain'. Kelly also noted that 'sedentism is usually considered a relative rather than an absolute condition'. Archaeologists discuss the 'emergence' of sedentism, with people moving less and less until they remain in one place, but Kelly pointed out that it was not always certain if this slow emergence of sedentism had been an actual phenomenon or a factor of a poor sampling of the archaeological record. Importantly, Kelly posited that thinking about sedentism 'as a point on a continuum of residential mobility' had led archaeologists to conflate different types of mobility – individual mobility, group residential movements, territorial shifts and migration. He also noted that the question of the causes of sedentism subsumed many other issues, such as whether people moved as a group or individually, how frequently and how far they moved. Kelly wrote that regarding sedentism as emerging on a continuum of mobility leads to viewing it as 'an important social and behavioural threshold, a "point of no return", after which sedentary peoples cannot return to a mobile life-style'. Kelly argued that although this was probably true in the majority of cases it was not always the case and that sedentary systems might not have involved all of the people in a region, with interaction and interdependence between communities who were living different lifestyles (Kelly, 1992, 49-50).

Irrespective of which intellectual traditions are followed or which language is used, there is still an ongoing ambiguity in discussion and writing on the topic of sedentism as well as that relating to other considerations of residential status. However, it should be noted that it is not likely that the solution to this ambiguity will be simply found by sorting through explanations – the problem in the debate has deeper and more profound ambiguity. Through time there have been many specifications of sedentism, including such propositions as "Well, I know sedentism when I see it". However, the foundations of this ambiguity need to be assessed to determine whether or not there is an intractable problem or whether the issue could be resolved by increased clarity.

2.4 The Issue of Self-Evident Propositions

Moore, Hillman and Legge described sedentism as 'a corollary of the full-time cultivation of cereals and pulses'. They also pointed out that sedentary communities were necessary

for craft production on a large scale, and noted that new forms of social organisation were necessary for the maintenance of harmony and dispute resolution as communities adopted a sedentary lifestyle. These changes eventually led to the types of political systems which controlled the first city-states (A. M. T. Moore, Hillman, & Legge, 2000, 13). The conflation of agriculture and sedentism has complicated the issue. Even if the former is to a certain extent necessary for the latter, agriculture can be practised by mobile peoples, as noted in Chapters 1 and 7 (e.g. Kelly, 1992; Lu, 2002).

Kelly also noted that some scholars have argued that sedentism:

> 'results from the perceived need for intensification. … Determining whether or not sedentism precedes intensification and social competition is critical to testing the social competition hypothesis. To date, discussion relies upon generalized archaeological sequences where it is not easy to say which comes first.' (Kelly, 1992, 54).

Even today there are elements of "self-evidence" in the way that prehistoric communities of a certain time period and geographical location are assumed to be "sedentary". As an example, Banning has a short chapter entitled 'Late Prehistory in Wadi Ziqlab, al-Kura, Jordan: From Sedentism to Olive Oil Factories' which, although discussing settlements in general terms, has no actual specific mention of sedentism or the permanency of settlements in the text itself (Banning, 2007).

Harris noted similar ambiguities in definitions relating to early agriculture, often associated with the beginnings of sedentism. He noted that there are many terms used, both in academic and more general circles, and that many of them have multiple meanings. He wrote:

> 'It is not only the sparse and geographically uneven sources of available evidence that hamper investigation of the beginnings of agriculture; the subject is also held back by conceptual and terminological confusion. This is partly due to the multidisciplinary nature of the enterprise, which has introduced into the discourse numerous terms that carry prior connotations from their disciplines of origin. For many years the semantic confusion has militated against analytical precision in our thinking about how and why agriculture emerged.'

Harris continued:

> 'Agriculture and domestication are prime examples of imprecise 'catch-all' concepts that create confusion because users of them tend to assume that others share the same, usually intuitive and seldom explicitly stated, understanding of what they mean.' (D. R. Harris, 2007, 17-18)

He noted that not only were a large number of different terms used in discussions about early agriculture but the same terminology was used both to describe specific agricultural activities and also for general categories of food production which were more complex and variable. He noted that scholars from different disciplines used terminology to mean different things. For example, biologists considered 'domestication' a dynamic process, whereas archaeologists and historians considered it as past events leading to new forms of plants and animals. Other scholars had questioned whether domestication had necessarily involved morphogenetic change and whether it should be used as a defining criteria of agriculture (D. R. Harris, 2007, 18-21). Harris, citing Smith (B. D. Smith, 2001) concluded:

> 'The either/or conceptual dichotomy of hunter-gatherers versus agriculturalists is deeply embedded in the discourse on early agriculture but it is a gross oversimplification of past human subsistence. We should no longer allow it to constrain our thinking, or go on trying to fit data to it. Instead, we should concentrate on how to investigate most effectively the resource spectra on which past human groups depended for their livelihood, including the "richly heterogeneous" societies that occupied the "vast and largely uncharted regions" between hunting-gathering and agriculture.' (D. R. Harris, 2007, 30)

In 2003, Terrell and co-authors proposed that:

> 'instead of trying to distinguish people today and in the past as either "foragers" or "farmers", it makes sense to define human subsistence behaviour as an interactive matrix of species and harvesting tactics'

They noted that scientists had learned that foraging was not as different from farming as previously assumed. In that article, Terrell and his co-authors posited that the belief that conditions in the past were different from how they are in the present has been enduring and strengthens archaeology's continuing search for the origin of things. This included the change from primitive to complex societies. (Terrell et al., 2003, 323-324).

2.5 Agriculture

There has been considerable and formidable scholarship on the origins of agriculture and the domestication of plants and animals. David Harris noted that by the 1960s, some archaeologists had begun to question what had been a 'rigid conceptual distinction between hunter-gatherers dependent on wild plants and animals and agriculturalists dependent on crops and domestic livestock', leading to terminology such as 'pre-

domestication cultivation' and 'pre-domestication animal husbandry' (D. R. Harris, 2007, 19).

In their introduction to a volume of papers from a 1991 symposium on the transition to agriculture, Gebauer and Price wrote 'What is astonishing is the fact that this process of domesticating plants and animals appears to have taken place separately and independently in a number of different areas at about the same point in time' after approximately three to four million years of food collecting and hunting. They noted that the transition to agriculture required long-term structural changes in society as well as a new relationship with the environment. Gebauer and Price highlighted the fact that there was no one reason for the change, with different factors playing more important roles in different areas, and still with no explanation of why foragers became farmers (Gebauer & Price, 1992, 1, 3).

There is also no agreement on what is meant by the use of the term "agriculture" when applied to the initial stages of its development. Vrydaghs and Denhan noted that there were 'persistent disagreements about what constitutes agriculture'. They wrote that as well as problems of definition, there were problems in differentiating archaeologically between early agriculture and other practices. Vrydaghs and Denham argued that the disagreements were more than semantic and were basic to the concepts being studied. They suggested that if the term agriculture was abandoned in these early contexts, there would still be debate about the nomenclature that replaced it. They noted that there were problems with the categories between hunter-gatherers and agriculture such as domiculture, incipient agriculture, complex hunter-gatherers, transitional- and proto-agricultural, wild-plant food production, hunter-horticulturalism and low-level food production. Vrydaghs and Denham also noted that most of the concepts used in the study of early agriculture were originally developed in relation to Eurasia, and that had inhibited its study elsewhere (Vrydaghs & Denham, 2007, 2, 7).

Gebauer and Price reviewed some of the major theories on the origins and spread of agriculture. Importantly, they noted that agriculture generally first began in areas with abundant resources, sufficient to feed local populations, rather than in areas of scarcity, which some scholars (for example, Binford) have sometimes assumed. Gebauer and Price posited that the initial agriculturalists had tended to be 'more sedentary and complex groups of hunter-gatherers', and that sedentism had preceded domestication in the Near East. This also applied to parts of Mesoamerica, Japan, northern Europe and North and South America. Gebauer and Price emphasised how, once agriculture was developed,

people could no longer move away from their neighbours, and thus there was evidence of violent conflict in some areas where agriculture spread (Gebauer & Price, 1992, 8-9).

Both Dennell and Moore have noted that interest in 'pristine' societies and their cultural processes have led scholars to overlook the opportunities offered by research into the overlap of hunter-gatherer and simple agricultural societies and the ways in which they influenced each other and the development of agriculture (Dennell, 1985, 113-114; J. A. Moore, 1985, 93). Recent research by Fuller and colleagues on the ways in which domestication and agriculture developed has shown that 'the pathways to agriculture were prolonged episodes of coevolution, genetic adaptations on the part of the plants, and cultural shifts and innovations on the part of the people'. In relation to plant domestication, they highlighted the fact that although agricultural communities had tended towards sedentism and higher population densities and in some cases sedentary hunter-gatherers had started the cultivation processes, 'more often it was initiated by mobile societies of hunter-gatherers or herder-gatherers' (Fuller et al., 2014).

2.6 Indices of Sedentism and the problem of the Neolithic

In 1865 Lubbock divided prehistoric archaeology into four periods – the Palaeolithic, the Neolithic, the Bronze Age and the Iron Age. He categorised the Neolithic as 'the later or polished Stone Age' in which beautiful weapons and tools were made of flint and other stone but with no metals except for gold. Lubbock referred to areas which were 'evidently the sites of dwellings or villages' in that time period, and noted that Neolithic pottery was often rough, with large grains of quartz and made before the advent of the potter's wheel (Lubbock, 1865 , 2, 17, 80-81). In the English-speaking world, Elliot Smith was one of the first scholars to group together the archaeological characteristics which became known as the Neolithic package, and Childe is credited with coining the phrase "the Neolithic Revolution". Pluciennik noted that by 1921 Burkitt had defined the culture of the Neolithic as consisting of agriculture, animal domestication, pottery manufacture and polished stone tools.[1]

[1] Recent books which have provided alternative viewpoints on life in the Neolithic and accepted indicators of sedentary life include, but are certainly not limited to, *(un)settling the Neolithic* (Bailey, Whittle, & Cummings, 2005), *Rethinking Agriculture: Archaeological and Ethnoarchaeological Perspectives* (Denham, Iriarte, & Vrydaghs, 2007), *The Neolithic Revolution in the Near East: Transforming the Human Landscape* (Simmons, 2007), *The Neolithic Demographic Transition and its Consequences* (Bocquet-Appel & Bar-Yosef, 2008), *Living Well Together? Settlement and Materiality in the Neolithic of South-East and Central Europe* (Bailey, Whittle, & Hofmann, 2008), *From Foragers to Farmers: Papers in Honour of Gordon C. Hillman* (Fairbairn & Weiss, 2009), *Ceramics Before Farming: The Dispersal of Pottery Among Prehistoric Eurasian Hunter-Gatherers* (Jordan & Zvelebil, 2010b), *Changing Natures: Hunter-gatherers, first farmers and the modern world* (Finlayson & Warren, 2010a), *Becoming Villagers: Comparing Early*

People today regard the Neolithic as having been fundamentally important, and Pluciennik, amongst others, suggested that this is because it is seen as the beginning of 'us', or today's society, and that the actual origins in the Eurasian hunter-gatherer societies have been ignored by Europeans (Pluciennik, 1998, 64). McCarter noted 'sometimes it's difficult to decide if a culture is actually Neolithic' (McCarter, 2007, 11). Kuijt has suggested that it may be necessary to reconceptualise the Neolithic 'as a social and economic process, in order to understand some of the possible links between population aggregation, sedentism, and social change' (Kuijt, 2000a, 4).

In 1997 Sherratt wrote that after years of the beginnings of farming being described as 'neither Neolithic nor a revolution' scholars were once again attributing it to 'a short, sharp shock at the end of Pleistocene, known as the Younger Dryas event'. Sherratt cautioned that it was necessary to clarify what was meant by the 'beginning of farming' in parts of the world other than the Near East if a climatic trigger is offered as an explanation. He noted that 'the term "Neolithic" may be used of hunters using polished stone axes or of village dwelling cultivators, and "farmers" of cave-dwellers collecting plants which may or may not have been genetically altered by selective gathering'. Sherratt cautioned that if a starting point is not defined, it makes equating it with a specific environmental change 'especially problematic'(Sherratt, 1997, 271, 274).

In 2007, Simmons stated:

> 'The "Neolithic" defies easy definition. Most scholars concur that it was an economic transformation that involved the domestication of wild food resources and the establishment of permanent settlements. It is not that simple, however, since there were at least semisedentary settlements in the Near East and elsewhere prior to domestication. Conversely, domesticated plants initially occur in some places, such as parts of the American Southwest, without the development of villages.' (Simmons, 2007, 4)

He went on to answer his own question of "What is the Neolithic" by noting that although it was an economic transformation, what changed was how people used food, rather than what was domesticated. He wrote that:

Village Societies (Bandy & Fox, 2010c), *Pathways to Power: New Perspectives on the Emergence of Social Inequality* (Price & Feinman, 2010), *Landscapes in Transition* (Finlayson & Warren, 2010b), *Tracking the Neolithic House in Europe: Sedentism, Architecture and Practice* (Hofmann & Smyth, 2013), *The Earliest Neolithic of Iran: 2008 Excavations at Sheikh-e Abad and Jani (Matthews, Matthews, & Mohammadifar, 2013), Seeds of Change: Exploring Neolithic Social Complexity* (Kuijt, in press) and *Sedentism: Worldwide Research Perspectives on the Shift from Mobile to Settled Ways of Life (Reindel, Benecke, & Schmidt, in press)*

> ‘This required technological innovations, many of which are preserved in the archaeological record, and many others that are more subtle. Any time that economic patterns and the material items that humans are so fond of surrounding ourselves with are changed, there are bound to be social consequences as well. All of these activities are part of the “Neolithic Package”, but it is impossible to establish a list of universal criteria, because even in the same parts of the world, this package varied depending upon a host of local circumstances.’ (Simmons, 2007, 5)

Ammerman explained that he and Cavalli-Sforza had in 1984 named the change from foraging to food production the ‘Neolithic transition’, rather than the ‘Neolithic revolution’. They had noted that after cereals were domesticated in the Near East and spread to Greece about 8,000 BC it had taken more than 2,500 years for early farming to spread from Greece to Scandinavia – a long, slow transition rather than a short-term revolution (Ammerman, 2003, 3).

The traits often grouped together to make up what Thomas termed ‘a uniform image of the Neolithic economy’ frequently involve:

> ‘the combination of sedentaryness, a stable domestic community co-resident in a permanently occupied structure, the cultivation of cereals in defined and continuously cropped fields, the keeping of a variety of domestic animals at individual farmsteads, and a proprietary or territorial relationship with land’.

Thomas noted that there were a number of issues on which this model could be contested in relation to the Neolithic in mainland Britain. There were far fewer houses than in later periods, and many of the structures which have been classified as houses might not actually have been lived in. Cultivation seems to have been episodic, and the field systems which have been identified were stock management paddocks rather than ploughed fields. He agreed with Whittle’s 1997 postulation of many Neolithic communities practising a type of tethered mobility with periodic returns to various fixed areas (Thomas, 1999, 14, 222-223).

In a problematic declaration, Akkermans and Schwartz wrote that, rather than the Neolithic beginning with the start of village farming in the Near East, as had previously been accepted, it was now understood that sedentary village life had in fact begun several millennia before the adoption of agriculture and stock rearing in the late 9^{th}-8^{th} millennia BC. They wrote ‘it is now evident that agriculture was not a necessary prerequisite of sedentary life, nor were sedentary settlers always farmers.’ They also posited that early Neolithic communities in fact had much in common with their Epipalaeolithic

predecessors, with the slow change from a foraging society into an agricultural one entailing a new set of social and economic values which centred around the house (Akkermans & Schwartz, 2003, 45). But these declarations are themselves problematic, as Shewan and Edwards have questioned the sedentary status of the Natufian populations upon which the Akkermans & Schwartz claim is based. This also involves issues about the definition of the residential patterns of complex hunter-gatherers (which will be discussed further in Chapter 8).

An additional consideration is that the Neolithic itself has become a problematic category. This has provided an opportunity for opening up discussion, and rethinking of the issues. The early part of the Neolithic period, as it occurred at different times in different parts of the world, is usually associated with the beginning of a move to a sedentary lifestyle, although, as suggested before, this may not in fact have happened, as some communities adopted facets of Neolithic life without settling down permanently. By the 1960s, the terms Mesolithic (sometimes called Epipalaeolithic) and Neolithic were being used to describe what Pluciennik termed 'a whole series of subsistence, technological and social correlates'. In these 1960s models, the Mesolithic hunter-gatherers were identified as mobile and egalitarian, while the Neolithic farmers were considered more sedentary and having possessed forms of social differentiation. He also noted that at that time, exotic materials were being treated as a sign of mobility at hunter-gatherer sites but as evidence of trade at farming sites. Pluciennik concluded that it was likely that in both the Mesolithic and the Neolithic there was intra-community variation in mobility (Pluciennik, 1998, 62-65).

Zvelebil commented:

> 'When prehistorians first defined the Mesolithic and Neolithic at the end of the last century, they could hardly have expected that these concepts would come to mean so many different things to so few people. The Victorian social scientists introduced these terms as chronological entities, as periods, the import of which was clear: they were chronological markers along the great road of progress from the primitive condition of man to "the blessings of civilisation" …' (Zvelebil, 1998, 1)

Zvelebil concluded the chapter with a comment that current comprehension of Mesolithic and Neolithic society was inadequate. Social organisation in Mesolithic society, defined by hunting and gathering, ranged from 'simple and 'egalitarian' to 'complex' and 'socially differentiated'. In the Neolithic, defined by farming subsistence, in the circum-Baltic area, for example, the combination of traits were implicit in the organisational

complexity of the late Mesolithic. In other words, there was considerable continuity across the Mesolithic/Neolithic transition (Zvelebil, 1998, 23).

In the abstract of a paper entitled *Transforming food practices in the Epipalaeolithic and Pre-Pottery Neolithic Levant*, Boyd wrote:

> 'The transition from the Epipalaeolithic to the Neolithic has been called the most fundamental transformation in human history. At the heart of this transition lies one basic issue: a change from one way of eating to another.' (Boyd, 2005, 106).

Boyd noted that knowledge is required both for the procuring of food in hunter-gatherer communities and for its preparation. Once agriculture is adopted, there is a reorganisation of land, labour and the distribution of produce, and this leads to ways in which people create differences between themselves. He commented that most scholarship on food acquisition and consumption at the Neolithic transition has concentrated on clarifying subsistence or economic activities. In this paper, Boyd addressed the absence of any theoretical consideration of the social and cultural aspects of the ways in which food and its accompanying material culture might have been 'perceived, acquired, transformed, consumed and discarded'. In particular, he questioned ways in which ground stone artefacts were used and their possible social significance (Boyd, 2005).

Pluciennik commented that archaeologists dealing with the Mesolithic-Neolithic transition 'have often accepted an oversimplified division between hunter-gatherer and agricultural societies'. He noted that they had often not considered the potential variability within farming societies in terms of subsistence, economy, social organisation and settlement patterns, partly because of the conceptual and academic differences between approaches to the agricultural and hunter-gatherer communities, in part following Childe's food-production emphasis as the defining Neolithic trait (Pluciennik, 1998, 61). Pluciennik concluded his consideration of the Mesolithic-Neolithic transition by emphasising that:

> 'it is not enough simply to substitute the unqualified word "farming", for example, for Neolithic, and "hunter-gatherers" for Mesolithic. There are at least three particular areas within the transition which need to be critically examined…. Neolithic farming is still often typified by reference to sedentary agro-pastoralism. It clearly need not have been so. Secondly, there is still the hegemony of subsistence as the defining feature of the Neolithic…. Thirdly, although with hindsight we may talk of societies "in transition to farming", history could have been otherwise…..' (Pluciennik, 1998, 77).

It was noted by Dolukhanov and colleagues that one influential archaeological school in the former USSR equates the Neolithic 'with the large-scale manufacture of ceramic ware and polished stone and bone tools by predominantly hunter-gatherer communities'. The pottery-making hunter-gatherer communities in the boreal forest regions of Eurasia had characteristics often attributed to complex societies, such as apparent sedentism, high population density, technological elaboration, intensive food procurement, exchange networks, social differentiation and territorial control. Dolukhanov and colleagues suggested that one explanation for the differences in the characterisation of the Neolithic could have come about from one movement of people across a very varied habitat, developing distinctly different traditions in different locations, but noted that this was not currently supported by radiocarbon dates. They theorised that there were at least two processes with different origins and time-frames involved in the Neolithicisation of Europe (Dolukhanov, Mazurkevich, & Shukurov, 2010, 238, 250).

Jordan and Zvelebil noted that recent discoveries with unequivocal evidence of ceramic manufacture and use by Upper Palaeolithic hunter-gatherer societies challenged the Soviet Marxist scholars definitions of the Neolithic, which included pottery as an invention of post-glacial hunter-gatherers. These were also at odds with the Western concept of a 'Neolithic Revolution' in which there is an inter-linked dispersal of pottery and agriculture (Jordan & Zvelebil, 2010a, 49-50).

In a study of Neolithic settlement in the Fenland Basin in the UK, Sturt commented that the adoption of agriculture had led to changes in the daily routines of the communities, and that these changes had left evidence in the archaeological record. Sturt posited that scholars often fail to explain the different evidence in terms of both regional variability and overall similarity. He noted that discussions of settlement in Britain had concentrated on the presence or absence of permanent structures, rather than considering the significance of variability in the remains. Sturt proposed that it was necessary to re-evaluate the interpretation of the archaeological record, considering it as a whole, rather than its constituent parts. He wrote that this was particularly important when studying transitional periods, and that the use of terminology such as Mesolithic and Neolithic could hinder the understanding of those transitions (Sturt, 2010, 23-24).

The ambiguities and lack of agreement in the defining of terminology was acknowledged by Thomas in 1999, who noted:

> 'when we come to discuss the term "Neolithic", we may be referring to a chronological horizon, a stage in an evolutionary scheme, a form of economy, a set of social relations or a cultural phenomenon. As a result of this, many of the

> debates concerning the introduction of the Neolithic to Britain or to Europe have been characterised by exchanges which have taken place at cross-purposes, in which the antagonists have actually been referring to phenomena of a quite different order'. (Thomas, 1999, 13)

Thomas went on to suggest that the problem was greatest with archaeologists such as Dennell, Zvelebil and Rowley-Conwy, who at that time had equated the term Neolithic with agriculture and regarded cultural and social innovations as subsidiary to the beginnings of farming. He noted that this had led to presumptions that where one element of the Neolithic package was present, other elements must also have existed. Thomas then suggested that 'any attempt to define a particular set of attributes as constituting the Neolithic will be arbitrary in the extreme'. He went on to note that even in the Near East, there was considerable difference in the domestication and use of plants and animals, with herded animals coming first in the Zagros foothills and cultivated barley and legumes first in the Levant. Thomas posited that it could be argued that the development of a settled lifestyle in the Levant had led to the domestication of plants and animals, rather than the reverse (Thomas, 1999, 13-14). But as noted earlier, this is predicated on the assumption that the Natufian represents sedentary life.

It was pointed out by Zvelebil that Lubbock had first defined the Neolithic in 1865 in order to distinguish the Old Stone Age from the New Stone Age, in which Neolithic people's subsistence included cultivation and animal husbandry to some extent, and in which they used polished stone and pottery. The terms Mesolithic and Neolithic were used as chronological markers in the progression of humans from primitive to civilised. Definitions of the 'Neolithic package' to define a society primarily by its mode of subsistence (agriculture) were subsequently refined by Childe. Zvelebil noted that one consequence of the redefinition of the Neolithic was that in Europe there had been a tendency to erroneously regard all Stone Age societies which used pottery and polished stone tools as food producing (Zvelebil, 1998, 1-2).

2.7 Proposed archaeological markers for sedentism

Scholars have provided various indicators for the identification of sedentism in the archaeological record. These purported material correlates of sedentism include site distribution and size, stone architecture, rectilinear buildings, ceremonial and administrative structures, cemeteries, storerooms and granaries, storage pits, material culture items such as pottery and heavy stone mortars, specialised tools, use of localised materials, commensal faunal species at higher frequencies, year-round seasonality of

hunting, development of agriculture, non-local tree species, thickness of archaeological deposits and workshop-style production of goods ((Guerrero, Naji, & Bocquet-Appel, 2008), (Binford, 1983, 112-113), (Biagi & Nisbet, 2006), (Boyd, 2006) and others). Whilst there is some consistency in these indicators, it is not universally accepted that they do in fact provide a definitive indication of the transition to permanent settlement, and the so-called 'material correlates' of sedentism can also occur in mobile societies (see Edwards 1989 and Fletcher 1995). Gamble stated that he had shown that 'it is no longer possible to regard material culture as a simple reflection of systemic developments' (Gamble, 2007, 271).

In a 1989 article, *Problems of Recognizing Earliest Sedentism in the Natufian*, Edwards made the point that there is no rigorous methodology for distinguishing between the prehistoric settlement remains of sedentary, semi-mobile and mobile hunter-gatherers. He demonstrated how many of the claimed material markers of sedentism in sites he examined showed 'too much overlap with former Pleistocene sites or recent mobile sites to be separable as novel developments', and that many of the proposed sedentary markers looked to ethnographic equivalents for reference, and needed 'much more ethnographic and experimental archaeological work for detailed comparative data to be gained' (Edwards, 1989a).

Despite this lack of clarity, some scholars tend to write as if there are secure material indicators. Kozarek, for example, in a book section entitled 'Determining Sedentism in the Archaeological Record' compared evidence of the organisation and maintenance of living spaces at the Jennison Guard site, a Hopewellian site on the south-eastern Indiana Ohio River floodplain, with 'expectations for the use and maintenance of space among groups that are highly mobile, seasonally migratory, and sedentary'. Through the use of these 'expectations', together with other archaeological evidence such as lithic procurement, refuse, floral and faunal remains she theorised that the site was occupied 'for a relatively long, uninterrupted period by a residentially stable group' who may have been logistically highly mobile. This is in contrast to a general understanding of the Ohio Valley people as having been migratory (or seasonal) hunter-gatherers (Kozarek, 1997).

Kent noted several possible material indicators of sedentism. These included an increase in site size and structure, more substantial dwellings, formal storage areas, refuse disposal patterns becoming more formal and restricted, cycles of chronic diseases that affect morbidity and mortality and diversification of activities at a site. She also noted that sedentism increases 'the use of functionally restricted activity areas and segmented architecture, such as storage platforms or huts' (Kent, 1989b, 150).

In 2004, Hardy-Smith and Edwards discussed theories concerning refuse behaviour and site abandonment, which had been developed mainly through ethnographic studies, in order to explore their potential in distinguishing degrees of mobility and sedentism in past communities. They examined the possibilities of applying those theories to the archaeological record of what they termed 'humanity's most fundamental settlement transition: from mobile hunter-gatherer to settled village farmer', combining artefact distribution patterns in the Natufian site of Wadi Hammeh 27 (c. 10,000 BC) with an overview of sites dated from c. 18,000 to 6,000 BC. From this data they concluded that 'human communities in the Natufian period had not yet tailored their indifferent household refuse disposal practices to the long-term requirements of sedentary living'. However, by the PPNA period (c. 8,200-7,200 BC) 'elementary efforts at refuse disposal' had begun, and in many villages by the PPNB period (c. 7,200-6,000 BP) 'some form of consistent garbage cycling was probably a standard feature. Hardy-Smith and Edwards noted that discussion about the origins of sedentism in the Levant had focussed on other aspects of the archaeological record such as settlement patterns, architecture, artefact typology and plant and animal remains but had not as yet used the theoretical framework on site abandonment and refuse disposal, despite recent studies into artefact distribution patterns (Hardy-Smith & Edwards, 2004, 253-255).

Near Eastern tell sites have frequently been associated with permanent occupation, with caves, small open sites and flat sites usually associated with short-term, impermanent occupation (e.g. Halstead, 2005, 48). But Evans noted that the distinction between tells and flat sites could be problematic, and that tells could represent something other than permanent occupation, even something like a place for obtaining or storing materials (J. G. Evans, 2005, 115). Watkins noted that the earliest Neolithic communities 'show a great deal of cultural concern with the architecture of buildings and the organization of whole settlements'. He used the example of Qermez Dere, in northern Iraq, which at the beginning of the Neolithic was a small settlement of sedentary [not defined] people. The settlement had two halves: initially the northern half had circular semi-subterranean plastered houses and the southern half was a refuse dump. Later the use of the halves was reversed, with housing in the south and a circular stone structure used for grinding and pounding in the north. Watkins commented that the buildings were very well built and maintained and some had been rebuilt several times. He commented that, according to his cultural traditions, they appeared more like 'homes' than 'houses'. Watkins also referred to Stordeur's excavations at Jerf, in northern Syria, with large-scale subterranean buildings in a structured built environment from c. 8,800 BC (Watkins, 2004, 100-101).

Monumentality has often been linked with sedentism. Recent excavations and discoveries at the site of Gobekli Tepe are frequently used as an example of early monumental construction which had needed craft specialisation and community effort. Nevertheless, there is no evidence for habitation at the site (Schmidt, 2010). Hildebrand wrote that scholars were re-examining the causes, purposes and social contexts of monumentality as well as its definitions. She noted that this is particularly pertinent in relation to monumental structures in Africa, where the archaeological record shows a long history of animal husbandry without sedentary farming (Hildebrand, 2013, 167). Thomas noted that the construction of monuments 'combines the elements of massiveness and memorability in different ways in different social settings'. Even small pastoral societies used them in many different ways and social contexts (Thomas, 2013, 321). This is another example of changing views of what actually are archaeological markers of a permanently sedentary community.

The classic index of sedentism is said to be ceramics, which have been seen as a marker of a sedentary community. However, ceramics are used by mobile communities and nomadic pastoralists, as demonstrated by Rafferty (Rafferty, 1985), Cribb (Cribb, 1991) and others. Rafferty noted that until the 1980s, the presence of ceramic vessels in a site had been used as an indicator of sedentism (Rafferty, 1985, 133). Scholars had assumed that people had only started using ceramics once they had settled down, partly because of the perceived difficulty in transporting heavy ceramic objects from one location to another. Writing in 1895, Mason typified the prevailing view that permanent residence was necessary for the invention of pottery. He listed many ancient people who used pottery, and noted that there were many contemporary 'uncivilised' non-literate societies who made beautiful ceramics. He wrote:

> 'But, just as soon as people had fire, became sedentary, ate farinaceous food, the pot came to be born. And in cold regions, the use of fire would, as we shall see, compel the invention of pottery.' (Mason, 1895, 153-154)

In his Foreword to the book *Ceramics Before Farming: The Dispersal of Pottery Among Prehistoric Eurasian Hunter-Gatherers*, Hayden discussed hypotheses relating to the invention, development and initial use of ceramics. He noted incidences such as the remains of two pots which represented semi-sedentary occupations 'spanning several thousand years' at Yuchanyan (c 18,000-14,000 BP). He also noted that early ceramics are often found in sites where aquatic resources were important. He commented on papers in the volume which showed that hunter-gatherer groups which used pottery were able to utilise enough resources 'to make a modest degree of sedentism possible', even in very early sites (Hayden, 2010, 20-23).

Jordan and Zvelebil wrote that consideration of the beginning of ceramic technology has been one of the most important ongoing issues in Old World archaeology. They also noted that the question had been subsumed in debates on the emergence of sedentary agricultural communities in the European context, with assumptions that ceramics were invented and used by early farmers, and that where ceramics were discovered in non-agricultural contexts they were assumed to be part of the Neolithic package traits that would inevitably lead to a farming economy. Recent research has challenged these assumptions, demonstrating that in some areas pottery making began before the Holocene, being invented by Upper Palaeolithic hunter-gatherer communities and therefore predating farming in much of northern Eurasia. Jordan and Zvelebil also noted that ceramic technology was independent of the plant and animal domestication of the Neolithic and probably originated in the Far East of Asia (Jordan & Zvelebil, 2010a, 33-36). They concluded the section with a comment that 'there is fetching irony' in Childe's concept of ceramic dispersal from the East – pottery did originate in the East, but in the East Asian Palaeolithic hunter-gatherer communities rather than the Anatolian farming communities of the early Holocene (Jordan & Zvelebil, 2010a, 50).

In discussion of ceramic innovation and social innovation, Jordan & Zvelebil noted that when Morgan (1877) had used pottery as a defining criteria for his 'barbaric' stage, he identified its use as a stage before agriculture, which he identified as developing in the stage of 'upper barbarism'. Jordan & Zvelebil wrote that it had been Lubbock who had drawn the explicit links between the invention of pottery and domestication of crops and animals as features of the Neolithic and that it was Lubbock's theories that were taken up by Childe in the 'Neolithic package'. Jordan & Zvelebil argued that the concepts of a Neolithic Revolution became so influential that archaeologists have continued to disconnect ceramic technology from it or from the advent of agriculture, and that discovery of early pottery has been used as evidence of the existence of agriculture. This has led to distorted concepts of the dispersal of agriculture through Europe and that pottery use by hunter-gatherers had originated from agricultural communities (Jordan & Zvelebil, 2010a, 45-47).

In the summary of his 1944 discussion of North American cooking pots Linton stated his conclusion that in North America there was no consistent relationship between basic pottery manufacture and settled life, nor between pottery manufacture and agriculture. He noted that the vessels produced in the northern complex were in fact both 'structurally and functionally adapted to the needs of nomads'. Linton stated that the connection was actually between sedentary life and the development of particular ceramic forms and uses.

Linton also noted that it had, for a long time, been recognised that cultural phenomena were common to the semi-nomadic hunting and fishing communities of far northern Eurasia and America, and he suggested that cooking pots and vessels which were structurally adapted for boiling food could also be included in this commonality (Linton, 1944).

In 1987, Dean Arnold included a chapter entitled 'Degree of Sedentariness' in his book *Ceramic Theory and Cultural Process*. He theorised that the degree of sedentariness could be used as a feedback mechanism relating the pottery production of a population to its relative mobility. He wrote that the usual generalisations that 'mobile societies provide total negative feedback for the origin of the craft and its evolution into a full-time specialization' and that 'sedentariness would provide deviation amplifying feedback for both the origin of pottery making and its evolution into a full-time craft' were fundamentally correct but oversimplified. Arnold detailed the views of earlier scholars such as Morgan, Linne and Nordenskiöld, particularly the theory that ceramics were not compatible with a mobile lifestyle, and highlighted examples of ways in which modern-day potters transport ceramics by hand without breakage using slings and bags or cushioning and noted that both sedentary and non-sedentary societies transport pottery. Arnold wrote that mobility limited the amount of time available for all the processes required for ceramic production in any one location. If a community remained in one location for long enough, it would also need access to all the resources necessary for ceramic production, in addition to a favourable climate, before it could start to become a ceramic manufacturer. He suggested that some 'partial sedentariness' would have been necessary for the initial development of ceramics, and that in more mobile communities it was unlikely that there would be full-time ceramic craft specialisation. Arnold quoted Murdock's (1967) *Ethnographic Atlas* showing 33% (103 communities) of pottery-making communities were non-sedentary. Of these, 15 were nomadic, 45 were semi-nomadic, 36 were transhumant or semi-sedentary and 7 were settlements which moved every few years (D. E. Arnold, 1985, 109-125).

In 1995, introducing a volume entitled *The Emergence of Pottery: Technology and Innovation in Ancient Societies*, Hoopes and Barnett noted that although it was clear from the archaeological record that most ceramics were produced by sedentary agricultural societies and that most mobile, foraging societies did not have pottery, it was a mistake to infer either sedentism or agriculture from the presence of pottery. They noted that, together with many other facets of the Neolithic, some complex hunter-gatherers had used pottery. Hoopes and Barnett also noted that technological innovations such as ceramic

production ‘have always had a profound effect on the human experience’ (Hoopes & Barnett, 1995, 2).

In 1995, Hoopes and Barnett noted that while the use and manufacture of pottery ‘was undoubtedly connected with increased sedentism’, the origins of pottery had not necessarily been related to permanent occupation. They continued with a statement that while pottery was used by seasonally mobile populations, the actual use of it was only in the context of the sedentary part of their annual cycle (Hoopes & Barnett, 1995, 4). However, other scholars would not agree that this was necessarily the case, believing that pottery vessels could be used while populations were mobile. Hoopes and Barnett also noted that sedentism had played a significant role in the emergence of ceramic technology, with the changes in raw material use and the organisation of labour. They also pointed out that the available foodstuffs had influenced the early shapes, functions and quality of the ceramic vessels (Hoopes & Barnett, 1995, 4). In 2010, discussng early ceramic production in Finland, Pesonen and Leskinen again associated the use of ceramics by hunter-gatherer societies with a move towards ‘increasing sedentism’. They also theorised that the repairing of ceramic vessels could be seen as evidence of a permanent lifestyle, with the ceramics being regarded as a valuable household item and part of the future use of the site (Pesonen & Leskinen, 2010, 299, 310).

Oyuela-Caycedo argued that ‘studies of early pottery should be focused more on pottery’s relationship to mobility and subsistence technology’ and that it was important to re-evaluate the relationship between the beginnings of pottery and sedentism. He noted:

> ‘Part of the assumption that pottery indicates some sort of sedentism is related to two factors: a reliance on ethnographic data to infer past conditions, and archaeologists’ lack of interest in demonstrating the context of pottery in relation to other aspects of the archaeological assemblage that could confirm or negate a relationship between pottery and sedentism.’ (Oyuela-Caycedo, 1995, 133)

He posited that climatic changes leading to a more arid environment, with concomitant changes to patchiness of resources, allowed several alternatives available to a hunter-gatherer population. A response which involved reduced mobility with more territorial controlling and monitoring of resources would encourage social or economic intensification. Oyuela-Caycedo theorised that pottery production, although not necessary, would be useful in such situations and would form part of the community’s risk management strategy. He also posited that when pottery was selected by a group it was added to the intensification cultural assemblage, rather than competing with or being used instead of other technologies. Oyuela-Caycedo wrote that it was likely that there would be a reduced diversity of form in the earliest pottery and there would be limited presence

in activity areas until the time when it could compete against other technologies (Oyuela-Caycedo, 1995, 134-135). Oyuela-Caycedo used the volume of ceramic remains to reconstruct activity areas in one stratum at the San Jacinto 1 site in Colombia. His team found from their analysis that the occupation had changed from short, repetitive visits in the dry season to longer and more stable occupation, that is, in their terminology, from a special purpose camp to a more permanent base camp (Oyuela-Caycedo, 1995, 139).

The Neolithic has been considered as a package, and Armit and Finlayson reiterated that little consideration had been given to the adoption of pottery by hunter-gatherer groups. They assessed this in relation to Mesolithic sites in Scotland where the upper levels of some sites had been considered Neolithic because of the presence of pottery despite their otherwise Mesolithic characteristics. Armit and Finlayson noted that there was no reason to consider that pottery and agriculture were adopted by those populations at the same time, and concluded that there was great regional variation in the form of the Mesolithic-Neolithic transition, including the adoption and use of ceramic technology (Armit & Finlayson, 1995, 270, 273). Simms and colleagues, too, highlighted the fact that although many highly mobile societies do not make ceramics, many others do, noting that Arnold had found that 40% of ethnographically known 'semi-sedentary' societies in the Great Basin/Plateau culture area did make ceramics. They used X-ray diffraction on archaeological samples from the Great Salk Lake area to test the hypotheses that with decreasing mobility there would be a greater investment in ceramics, and with increasing mobility there would be greater use of material from dispersed sources. Their results showed general agreement with the hypothesis that increasing residential stability would lead to greater investment in the quality of ceramic manufacture. They also noted that the ceramic-mobility relationship was particularly applicable to the initial stages of the transition to food production, for example the Archaic-Formative transition in areas of the American Desert West (Simms, Bright, & Ugan, 1997, 779, 789-790).

Rice noted that early pottery sites generally did not show evidence of 'full, year-round, permanent, sedentary settlement and housing' as had previously been assumed to be necessary for the widespread adoption of pottery. She also noted, however, that in many coastal and riverine regions where early pottery has been located the settlement system was 'more likely to have been one of long-term semisedentary foraging and collecting'. Rice wrote that ceramics, sedentism and food production cannot be completely separated, but posited that sedentism and food production (especially of cereals) need to be studied and understood independently. Rice also noted that she subscribed to the theory that in the temperate Eastern United States agriculture may have started when climate and sea-level changes in the Middle Holocene provided varied, abundant and disturbed habitats

ideal for pioneer plant colonisation in riverine and coastal areas. Because of the seasonal availability of resources, favoured site areas would have been reused and reoccupied, leading to further disturbance and enrichment of the soil, allowing colonisation by opportunistic or collected plant species. This would eventually have led to storable surpluses, allowing for reduced mobility in the population, highlighting what other scholars had noted, that storage is only an important part of a subsistence strategy when resources are both seasonal and abundant. The need for storage appears to become greater as the latitude increases, both because of the differences in subsistence base and the longer 'shelf-life' of the resources (Rice, 1999, 24-25, 34).

The aggrandizer/competitive-feasting models propounded by scholars such as Kelly (Kelly, 1991) and Hoopes (Hoopes, 1995) were summarised by Rice as follows:

- 'Early pottery will appear in the context of seasonal occupations, rather than fully sedentary settlement.
- Early pottery vessels will appear (whether by invention or adoption) among complex hunter-gatherer groups as part of emerging social rank distinction.
- They would be expected to consist of special-purpose vessels, associated with accumulating, storing, preparing, and serving special foods; such foods might be carbohydrates in protein-rich environments or fats and oils in areas with predominantly starchy diets'.
- Vessel capacities (either size or number of vessels) should be large, i.e. sufficient for storage, serving, and consumption of the contents.' (Rice, 1999, 12)

Whereas for some time some scholars have accepted the use of ceramics by hunter-gatherer groups, particularly those defined as being more complex, some do not. In 2004, Evans was still writing of the conventional assumptions that ceramics were inappropriate vessels for mobile foragers. She linked ceramics and agriculture as part of a Mesoamerican package of traits that were adopted together, suggesting that in permanent settlements large ceramic vessels were used for storage of water as well as grains, and for softening and cooking dried maize and for fermenting alcoholic beverages (S. T. Evans, 2004, 96).

That the material markers are not self-evident is clear from Bailey and Whittle's comment that, for many Neolithic sites:

> 'the critical qualifier is the presence (or in many cases absence) of appropriate excavation and analytical controls over inter-assemblage micro-chronology and taphonomic process. As important is the recognition that even in cases where high

levels of attention to recovery detail are present ..... we are left with a site that gives itself equally to either a sedentary or a mobility interpretation.' (Bailey & Whittle, 2005, 2).

2.8 Conclusions

The confusion in classification and the ambiguities in the way sedentism has been viewed by scholars lie at the heart of the problems of analysing trajectories towards sedentism and the recognition of the time periods involved in the transitions from a mobile to a completely sedentary lifestyle. These confusions in classification and the ambiguity inherent in them reflect the historical influence of the linear progression model and the fact that the relationships between many of the variables are not clear. These factors also apply to many of the definitions of prehistoric life, including mobility, the Neolithic, the "Neolithic package". In addition, agriculture is not definitively linked to sedentism because agriculture can be practised by communities which are definitely mobile. The material indices of sedentism and archaeological evidence previously accepted as markers of sedentism no longer hold secure. Many of the so-called indicators can be found in mobile communities, particularly communities who move in and out of their settlements on a seasonal basis and thus cannot be reliably used as defining characteristics. An example is the way views have changed about the development and use of ceramics by non-sedentary communities. The linking of the initial use of ceramics with sedentism is a representative illustration of the "self-evident" thinking. As noted, there are similar definitional confusions and ambiguities in the use of the terms related to mobility and pastoralism, creating an extended definitional ambiguity that encompasses the spectrum from mobility to sedentism. Currently many prehistoric communities have been described as "semi-sedentary" or "seasonally sedentary", whereas they might, and perhaps more appropriately, be described as "semi-mobile" or "seasonally mobile".

Some of the ambiguity may have arisen because scholars have talked about the material correlates of sedentism without having an explanatory foundation in an operational understanding of sedentism. Other causes may be much deeper and relate to the concept of "progress" and the juxtaposition of logical ambiguity with the problematic social/material correlations. Until such time as analysis of the way sedentism operates can produce definitions, terminologies and indices which can be agreed upon by scholars, we will lack consistency in descriptions of sedentary lifestyles and in our theories on the processes of becoming sedentary.

PART II – HISTORY AND CONTEXT

Chapter 3: From Ancient Greece to the Enlightenment and the mid-19th century

'Our understandings of the history and technology and of the broader significance of technological change have long been conditioned by social evolutionary notions of progress that emerged in the middle of the 19th century and dominated archaeology and anthropology until the 1960s'

(Jordan & Zvelebil, 2010a, 45)

3.1 Introduction

The next chapters (Part II) will provide a selection of the scholarship on the subject of "settling down", generally following the historical timeline of the original works. The way in which linear stage theories of human development have influenced and hindered consideration of the process of the transitions to sedentism will be reviewed to illustrate the basis of the self-evident viewpoints and the sources of the ambiguity and terminological inconsistency, which are deep-seated issues in the history of scholarship on the subject. This chapter will look at the history of the discussion from the 4th century BC to the mid-19th century, to provide a sample of some writings that illustrate the overall trends in opinion through the period under consideration.

Although there was some related scholarship dating back to the Classical era, the foundations of what has sometimes been termed "the sedentism debate" lie primarily in writings from the 18th and 19th centuries which propounded theories of the so-called "progress" of humankind in stages, advancing only in one direction from what was seen as savagery through to civilisation. Social philosophers at that time attempted to identify laws that governed the course of human history and the development of cultural systems, and the linear progression themes they developed formed the framework for theory and sociocultural research which predominated into the mid-20th century (M. Harris, 1968, 9). These writings, particularly from the 18th century, are the source of many of the ambiguities and lack of clarity which surround the issue. The sedentism debate was not founded on empirical data or even on comparisons, as the 18th and 19th century scholars did not have access to such data, and generally had no means of identifying the order of events or the actual time periods involved. Rather, they were obliged to conceptualise the process and hypothesise about it from the beginning, without recourse to previous scholarship on which to base many of their assumptions. Much of their work relating to peoples in other continents was based on second- or third-hand accounts from travellers,

often written many years after the initial encounter with those peoples, and therefore sometimes lacking in accuracy. Scholars in the Enlightenment period had often taken an ethnographical approach, using contemporary non-Western cultures to demonstrate what they assumed conditions would have been like during the different stages of evolution, without any real basis in fact. Trigger noted that some of these scholars used the similarities in societies in both the Old World and the Americas to validate their assumptions of parallel evolution in different parts of the world (Trigger, 1998, 38).

There is less apparent ambiguity in the works of the scholarship covered by this chapter than there was in later periods, but it was present. One of the ambiguities arose from a lack of definition of what was meant by the use of the term "pastoralist". Some scholars did clarify that they were referring to nomadic pastoralists and others that they were referring to agriculturalists, but many did not specify, and later scholars therefore made assumptions which may have been incorrect or incomplete.

Starting from the time of Aristotle in the 4th century BC (if not earlier) (see below), with the tradition continuing until the 20th century, scholars appear to have regarded it as self-evident that everyone would want to become "civilised", and their theorising and observations were thus apparently defined by that premise. As part of this intellectual tradition, the transition to sedentism appears also to have been viewed by most of these scholars as self-evident, and as an automatic development which would eventually be adopted by almost all societies as they "sought" to become increasingly more "advanced" and complex. These assumptions of an automatic progression to sedentism meant that in general the processes considered to be involved in becoming sedentary were not discussed in detail in writings of those times. The self-evident viewpoint also led to the lack of a critical reappraisal of the unilinear stage theories by later scholars. It is only in the last few decades that such critical reappraisals have started to emerge, especially once agriculture had been shown not to be a universally "good" improvement.

Marvin Harris pointed out that sociocultural evolutionary theory has a Biblical tradition. The Old Testament suggested that originally there were no families and no economics, government or warfare, and subsistence activities required very little effort. This changed with a 'foreign migration', which led to family life and more burdensome subsistence tasks. In the Biblical text, economic specialisation began with Cain as the hunter and cultivator and Abel as the shepherd. After the slaughter of Abel, Cain's descendants founded cities, which led to the development of urban life. Harris noted that orthodox European views, particularly the Biblical accounts of the origins of institutions and the order in which they occurred, were challenged in the Enlightenment period by the

sociocultural evolutionary positions being proposed by scholars. Harris also wrote that evolutionary thought in the Enlightenment was influenced by Lucretius's 55BC treatise *On the Nature of Things*, which itself had drawn on Epicurus' evolutionary theories from the 4th and 3rd centuries BC (M. Harris, 1968, 25-26). A factor in the assumptions about sedentism may therefore be the very short span of time that was assumed for human existence until the mid-19th century. Because Europeans assumed that Bishop Ussher's calculation that the world began around 4,000 BC was accurate, and also knew by the 18th and early 19th centuries that civilisation in places like Egypt was very "ancient", the idea that much of human existence had been sedentary and agricultural and even urban seemed "normal" and unproblematic. Mobility, rather than sedentism, was the conundrum until the expansion of the time span for human evolution increased vastly in the late 19th and early 20th centuries, and made being a mobile hunter-gatherer the enduring "normal" behaviour of human beings.

3.2 Writings relating to sedentism and the "three stage theory" from the 4th century BC to the Enlightenment period

Despite frequently being referred to as the "Three-Stage Theory" of human development, scholars in the 18th and 19th centuries had actually proposed various models of the progression of humankind. These covered between three and ten stages in the evolution from a savage state (living a mobile hunting and gathering lifestyle), through a state of barbarism (with the issue of pastoralism entangled in that stage or else marginalised), to a civilised condition (living an urbanised lifestyle).

A Sumerian poem from the Uttu cycle, dating to before the end of the third millennium BC, described conditions after the creation of humans, when they had not yet learned living skills such as bread-making, brewing or weaving clothes, and who lived 'in the reed thicket'. The poem described how these people were then apparently taught how to plant grains, breed domestic animals and build brick houses (Albright, 1935, 425).

Although referring to technological rather than social development, Renfrew and Bahn noted that a Chinese philosopher in the Eastern Zhou period (c. 770-221 BC) had written about the progression from the use of stone implements to those of bronze and iron:

> 'In the age of Xuan Yuan, Shen Nong, and He Xu, weapons were made of stones, for cutting trees and building houses, and were buried with the dead … In the age of Huang Di, weapons were made of jade, for cutting trees, building houses and digging the ground ... and were buried with the dead. In the age of Yu, weapons

> were made of bronze, for building canals … and houses … At the present time, weapons are made of iron.' (Renfrew & Bahn, 2005, 265)

Thwaites reported that Aristotle (384-322 BC) had theorised that the world had made three steps 'to arrive at the perfection which it possessed in his time'. Aristotle had posited that originally, humans were content with life, 'seeking purely and simply only those things which were necessary and useful for its preservation'. In the second stage of existence, they 'united the agreeable with the necessary, and politeness with necessity'. Aristotle had noted that they first found food, and then materials to season it. In the beginning, they covered themselves against the severity of the weather, and afterward grace and beauty were added to their garments. In the early ages, houses were made simply to be used, and afterward they were made to be seen.' In the third stage, Aristotle had proposed that 'men of intellect, seeing that the world was enjoying things that were necessary and pleasant in life, gave themselves up to the contemplation of natural objects and to scientific researches; whereby the great Republic of men has little by little perfected itself, necessity marching on ahead, politeness and gentleness following after, and knowledge bringing up the rear.' (Thwaites, 1959, v VII, 7).

Aristotle also set down a series of stages of social development in relation to the development of cities. This started with a household, which existed to provide humans' everyday needs. In the second stage, scattered villages were formed by a number of households capable of providing more than the basic everyday needs. Aristotle wrote that the 'most natural' formation is from within a related clan group, where the ruler is the eldest. He posited that this was the way in which the earliest form of Greek kingship had originated. The third stage, a self-sufficient city-state, came about when several villages were able to join together and thereby enjoy a good standard of living (Lovejoy & Boas, 1935, 174-176).

Although not writing in terms of stages as such, Diodoros Siculus commented (c. 50 BC) in *Bibliotheca historica* that the original humans had 'led an undisciplined and bestial life' without knowledge of clothing, habitation or fire. Gradually they learned to retreat to caves in winter and to store preservable fruits, and later acquired the use of fire and other important skills (Toulmin & Goodfield, 1965, 37-38).

The earliest known extant writing on the so-called "three stages" in terms of savagery, barbarism and civilisation is in Varro's 1st century BC *On Farming* (c. 32 BC), in which Varro quoted Dicearchus, said to have been a member of the Peripatetic School (Kramer, 1967, 73-74). Varro reported that Dicearchus had written that human life had gradually

developed in four stages from the 'remotest antiquity', when humans lived in a natural state, eating what the earth produced. From this they moved to a pastoral stage, where they fenced and tamed animals in addition to gathering nuts and fruits. The next stage in their progression was the development of agriculture, while still retaining many characteristics of the first two stages. Dicearchus had proposed that humans had then made gradual advances to the civilised condition of his time (Varro, 1st century BC, 127). Porphyry (234-305 AD) also reported on Dicearchus' theories on the moral and physical superiority of 'primitive men', positing that the earliest humans had been 'akin to the gods' – a 'Golden Race' compared with the people of his generation (Lovejoy & Boas, 1935, 93-95). Kramer noted that the origins of these models extended back before Dicearchus's time, probably even before Hesiod (c. 735 BC) (Kramer, 1967, 74).

Along with other Classical thinkers such as Tacitus, Dicearchus is reported to have used the term "descended" in relation to the progression of humankind from a state of nature to contemporary times, whereas later scholarship tends to ascribe the concept of humans "ascending" from primitive conditions to civilisation (Lovejoy & Boas, 1935; Varro, 1st century BC). This "ascending" view started with the Enlightenment philosophers, who viewed each later stage as an automatic improvement on the previous one, as they incorporated reports of discoveries of new countries and new people into their theories (Kramer, 1967, 77). Bryson noted that the Enlightenment philosophers had handled the question of reported differences in culture and achievement by theorising that the societies concerned were at different stages of maturity (Bryson, 1945, 53).

In the speech, *Pro Sestio*, Cicero declaimed that his listeners would all know how, before natural and civil laws had been formulated, that there had been a time when humans had 'roamed, scattered and dispersed over the country', with only the possessions they had captured by their own strength. He suggested that the more intelligent people gathered others around them 'and brought them from that state of savagery to one of justice and humanity'. Cicero theorised that after divine and human laws had been introduced, people grouped together forming associations which then later developed into walled cities (Cicero, 56 BC, 159-161).

In *De Rerum Natura* (c. 55 BC) Lucretius did not divide the development of humankind into specific stages as such, but portrayed early humans as hardier and stronger than those of his time, noting that they lived in 'woodland thickets or sometimes in caves', eating what nature provided. He wrote that, in time, humans learnt to build 'rude huts', and began to become less hardy. Later, rulers established walled cities for protection and, once gold was discovered, the concept of wealth developed (Lucretius Carus, 55BC, 225-

233). Lucretius also identified the progression in the use of stone, bronze and iron implements. Lovejoy & Boas stressed how much of Lucretius's portrayal of humans' early development is embodied in Rousseau's work, particularly in the *Second Discourse* (Lovejoy & Boas, 1935, 240). In a similar vein, Cicero's reverential use of the word 'nature', without a clear definition of its meaning, was taken up by many of the Enlightenment writers (Lovejoy & Boas, 1935, 252).

A similar schema exists in Indian literature, which identifies four Yugas, or ages, through which humans descended (Kramer, 1967, 73-74). Lovejoy and Boas noted a passage in the *Vãyu Purãna 8*, in which it is recorded that in the beginning of the Tretã Age, when the Kalpa trees which had provided shelter were destroyed, humans were forced to find alternative sources of protection, such as constructing houses. Previously people had moved around the landscape, but then stayed wherever they found suitable in the deserts, valleys, mountains and caves. They began by constructing houses as protection against heat and cold, basing their designs on the way the boughs of the trees had formed. Later they developed villages, towns and cities. After the plants on which humans had subsisted all perished, the people asked Svayamhu, the Lord of Creatures for help with their sustenance. When the plants Svayayamhu recreated failed again, he devised an economic system based on manual labour and the cultivation of plants. Following this, he established craft and economic specialisation (Lovejoy & Boas, 1935, 438-440).

The next extant instance of an author writing of cultural stages in the same way as Varro had done comes from the late 12th century AD (Kramer, 1967, 76). Giraldus Cambrensis, or Gerald of Wales, reported that the Irish 'have not progressed at all from the primitive habits of pastoral living'. He wrote that the usual progress of humans was 'from the woods to the fields, and then from the fields to settlements and communities of citizens', whereas the Irish did not apparently see the need to change their lifestyle from the woods and countryside. Cambrensis commented that the only 'commendable diligence' he found in the Irish was in the making of music and musical instruments, in which he found them to be more skilful than any other peoples he had encountered (Cambrensis, 1185, 101-103). Kramer noted that Cambrensis differed from most scholars in the Middle Ages in his use of ancient tradition to account for observed phenomena (Kramer, 1967, 77).

Renaissance era (14th to 17th centuries AD) scholars addressed various historical, sociological and ethnological conundrums. Among them were the question of the origins of the indigenous people in the Americas, the substitution of a more historically-based chronology of the world for that based on Genesis, and the issue of whether savagery had preceded other types of human culture (Hodgen, 1964, 308). It was noted by Pagden that

Las Casas's 1551 work *Apologética historia* had attempted a causal explanation for the condition of the American Indian world. Among other factors he used Cicero's statement that 'In the beginning all mankind lived an itinerant life, without any form of civil organisation …' until someone persuaded them 'to live together and gather themselves into societies'. Las Casas theorised that humans have an innate ability to create civil societies, but not all were able to exploit it in the same way. In time, Las Casas posited, the American Indians and other 'barbarians' would become civilised in the way that Europeans had (Pagden, 1982, 140-141). In the late 16th century, Acosta had theorised that the development of written language had occurred at the same time as the change from a barbarian to a civilised lifestyle. He had posited that as a society became more complex, the language used to describe its social order became more sophisticated. Acosta had also proposed that living a civilised lifestyle suppressed the primitive side of humans, and consequently once people were permanently removed from their settled homes they would quickly return to a state of savagery (Pagden, 1982, 186, 196).

Smail noted that after Hesiod (c. 700 BC) wrote of the Golden Age of Mankind, many historians, writing in Latin and Greek, began their 'histories' in Eden, whereas others started with Genesis. Sir Walter Raleigh had begun with Eden, and Bossuet (1681) began with the Biblical account in Genesis. Other historians such as Jean Bodin and anthropologists in the 16th century had ignored the concept of a Golden Age and began writing of a progression from a pastoral to an agricultural society (Smail, 2008, 15-16).

3.3 The Enlightenment Philosophers

The period of approximately one hundred years from about 1690, with the publication of John Locke's *An Essay Concerning Human Understanding*[2] to the beginning of the French Revolution (1789), is generally known in Western scholarship as the Enlightenment, although some writers ascribe earlier or later dates to the period. During this time philosophers, theorising on the course of human history and evolution, were concerned with establishing the way in which humankind had, as they saw it, progressed towards civilisation. Their theories almost always (although there were exceptions) positioned "savage" hunter-gatherer populations as the "original" state of humankind, with progression through "barbarous" pastoralists to "civilised" urban dwellers. It appears that these scholars did not, in general, consider the phenomenon of becoming sedentary as anything other than a natural part of what they saw as a progression towards

[2] *An Essay Concerning Human Understanding* was originally drafted in 1670-71 and published in 1690

civilisation, and therefore there are very few references to the actual processes involved in becoming sedentary. This self-evident way of conceptualising changes in human settlement patterns continued in Western scholarship through to the mid-20th century and beyond.

Four stages – hunting, herding, farming and commerce – were described by O'Neill, who posited that the civilisation stage was, for the Scottish Enlightenment writers, 'a normative judgement about the moral progress of society'. He quoted Pocock's concept of the Scots' interpretation of the culmination of the development of society as having civilised manners as 'the greatest change wrought by the Enlightenment in the field of social and historical thought'. O'Neill noted that Pocock had theorised that the basic theme of the Enlightenment philosophy was the beginning of a 'shared civilization of manners and commerce, from which sovereign European states grew' (O'Neill, 2007, 10).

In 1998, Trigger noted that much of the work of the French and Scottish philosophers of this period was aimed at realising political reforms which would serve the interests of their middle classes (Trigger, 1998, 31), which may have distorted general understanding at the time. Trigger also noted that the Enlightenment philosophers believed that progress was represented in all aspects of human behaviour, and that changes generally followed a single line of development. These philosophers theorised that at a particular level of development humans would independently formulate similar solutions to problems, so that their lifestyles would tend to develop in analogous ways. Western Europeans were seen as having progressed through more stages than other peoples, with the technologically inferior societies assumed to have only progressed through the initial stages (Trigger, 1998, 35). Many of the writings of this time were also focussed on concepts of property and ownership and their relationship to the development of what was then seen as progress towards a civilised society.

In addition to the philosophers who theorised that all humans would eventually progress to civilisation, there were others who theorised that 'coloured' people were naturally inferior to white Europeans. Eze argued that the Enlightenment's declaration of itself as the Age of Reason was based on the assumption that reason could historically only reach maturity in modern Europe, while people from areas outside Europe, of non-European racial and cultural origins, were consistently described as being rationally inferior and savage. Eze noted that scholars such as Hume, Kant and Hegel had contributed to the idea of European racial, as well as cultural, superiority (Eze, 1997, 4-5).

Beginning the Enlightenment philosophers' discourses on the progression of humankind, Locke posited that the thinking of 'savages' was limited by the values of their own countries. In his discussion of innate principles and the attaining of knowledge, he asserted that some people did not build bridges or houses because they had 'never applied their thoughts and faculties sedulously and intently that way but have contented themselves with the fashions and things of their country'. Locke also suggested that, had they been educated in England, they 'had perhaps been as zealous a Christian and as good an architect as any in it' (Locke, 1690, 46).

The Spirit of Laws was published in 1748. In this work, Montesquieu discussed populations in relation to their procurement of subsistence. He wrote that savage nations were made up of dispersed clans and were generally hunters, whereas barbarous nations comprised herdsmen and shepherds. Montesquieu recognised that people in Siberia were not able to live in fixed groups because they would not be able to find sufficient food, and noted that the Tartars were able to live in groups for some period of time because their herds and flocks could be moved wherever they were needed. He suggested that people who did not cultivate the earth 'wander and disperse themselves in pasture grounds or in forests', and theorised that these mobile people did not have security in marriage because it was not made permanent by housing (where the wife could continue to live in one house). They also had great freedom, and 'if one chief should deprive them of their liberty, they would immediately go and seek it under another, or retire into the woods and live with their families…'. Montesquieu also noted that herdsmen were tied to one area because they were unable to leave their cattle (Montesquieu, 1748, v. 1, 276-277).

In Hutcheson's 1750 collection of commentaries on Mandeville's *The Fable of the Bees* (1714), the assertion was made that humans will always seek 'progress':

> 'What man, who had only the absolute necessaries of meat and drink, and a cave or a beast's skin to cover him, would not, when he had leisure, labour for farther conveniences, or more grateful food?'

The argument was also made that once a country had reached its carrying capacity, the next generation would not be able to subsist without increasing labour and developing agriculture. Following from this, it was argued that if three-quarters of the population could support the community through agriculture, the remaining quarter, if applying themselves fully to 'mechanic arts', would produce more than would be achieved by a quarter of the labour of each individual by themselves (Hutcheson, 1750, 49-52).

Trigger described Turgot's work as 'the first comprehensive formulation of the concept of sociocultural progress' (Trigger, 1998, 31). Barnard credits Turgot with being the

originator of the concept of three stages of society in subsistence terms (referring to hunting, herding and farming) although his late 1740s essay was not published until after his death (Barnard, 2004, 33). In *Notes on Universal History* (written in the 1740s and 1750s), Turgot posited that initially people had dispersed because they needed a vast space in order to sustain themselves. He theorised that pastoral life was always introduced whenever people came into contact with animals which could be herded. Pastoral people had a more abundant and secure subsistence and therefore became more numerous and, as they became richer, were influenced by the idea of property. In Turgot's schema, pastoral people who moved into fertile country became agriculturalists, with the earth sustaining more people than were required to work it. This freed some people for other work, leading to the beginnings of towns and of commerce (Stephens, 1895, 177-181). Marvin Harris noted the similarity between the hunting stage in Turgot's work and the ecological interpretation of the patrilineal band in Steward's 1955 *Theory of Culture Change* (M. Harris, 1968, 28) – another indication of the way in which the Enlightenment philosophers influenced later thought.

In 1945 Bryson noted that the Biblical account of the construction of the Tower of Babel, leading to humankind spreading out all over the earth, was a convenient concept for scholars such as Kames and Goguet to use to explain differences between peoples in different parts of the world (Bryson, 1945, 93). Goguet had posited that this dispersion had led to a loss of knowledge as people became isolated and, for societies in some parts of the world, a return to barbarity. In this state, 'men wandered in the woods and fields, without laws, without leaders, or any forms of government. … not a few had forgot even the use of fire.' Goguet wrote that people who settled in places such as Persia, Syria and Egypt had quickly established fixed residences by working as a group. They retained some of their knowledge and used it to improve their conditions. He theorised that humans would not have been content with a savage and unsociable life, and this provided incentives for families to once more associate with each other in order to progress (Goguet, 1761, 3-6). Goguet also proposed that nations who were not practising agriculture did not need to understand or have knowledge of many arts and sciences. He theorised that cultivation required its practitioners to remain in a fixed place and discover the arts they needed, whereas hunter-gatherers had made little progress in the arts (Goguet, 1761, 85).

In his 1753 work, *Discourse on the Origin and Foundation of Inequality Among Mankind*, Rousseau also questioned how people who had no fixed dwelling place would be able to progress or improve and enlighten each other to any great extent, when they were scattered through the forests with very little communication with each other. In his view,

because of this lack of communication, discoveries would not be passed on through the generations, and thus people would have to continually start afresh in developing technologies and other innovations. In a similar manner to Goguet, Rousseau envisioned that there could only have been progress once humans began to live closer together, 'in a social way' (Rousseau, 1753, 99-113)

Many of the Enlightenment scholars wrote in a way that seems vague and imprecise to 21st century readers, and the inevitability of a transition to a sedentary lifestyle was apparently so obvious to them that they frequently did not mention it as such or glossed over it. In his *Essay on the History of Civil Society*, in a chapter entitled "Of the History of Rude Nations", Ferguson wrote that nations 'have been derived from a feeble original, and still preserve in their story the indications of a flow and gradual progress'. He suggested that most 'respectable' nations of his time had begun with a few pastoral families, and that even the Greeks had been descended from migratory, warlike tribes (Ferguson, 1767, 112-113). Millar wrote in 1771 that the taming and pasturing of cattle could be seen as 'the first remarkable improvement in the savage life' (Lehman, 1960, 203).

An Inquiry into the Nature and Causes of the Wealth of Nations was published in 1776. Adam Smith's thesis on commercial society was based on four main stages in human history – hunter-gathering, shepherding, agriculture and commerce. Hont summarised the principles of progress in Smith's first three stages as:

> 'Mankind found itself compelled to turn from hunting to shepherding and then to agriculture as the primary ways of material self-preservation under the double pressure of depleting natural resources and growing population.'

Hont questioned Smith's claim that commerce was similarly a natural development, noting that barter and trade had already existed in the earlier stages (Hont, 1987, 254). Interestingly, Smith recognised that settling down had not necessarily led to greater free time. He wrote that shepherds had a great deal of leisure time and initially farmers had some, but craftsmen and manufacturers had none. Smith posited that as improvements were introduced to farming through progress in arts and manufacturing, farmers were left with no more free time than craftsmen (A. Smith, 1776, 155-156).

Home of Kames introduced his *Sketches of the History of Man* with:

> 'The Human Species is in every view an interesting subject, and has been in every age the chief inquiry of philosophers. … but there is still wanting a history of the species, in its progress from the savage state to its highest civilization and improvement.'

He went on to say that after thirty years he realised that he could only cover a small portion of this subject (Home, 1776, v.I, 1). Home proposed that the renewed progression of humans after the Tower of Babel incident had led to the dispersion of humans throughout the world, with a concomitant loss of their previous knowledge 'rendering them savages' (Home, 1776, v.I, 65). He wrote that hunting and fishing continued for a long time, but that as industrious people started to rear their own stock and hoard supplies, 'the shepherd-state was perfected'. Population increased in the shepherd-state era, and over time tribes fought over pasture and some migrated to new lands. Home argued that agriculture developed from necessity, initially as a communal activity. He theorised that as land was divided up and populations again increased, governments became necessary in order to regulate agriculture and commerce (Home, 1776, v.I, 72-74). Bryson wrote that the Biblical story of the Tower of Babel was a 'convenient catastrophe' for Home, who used the theoretical dispersal of humans as a basis for his racial theories and to 'reconcile a rather pale primitivism with an ardent belief in progress' (Bryson, 1945, 93).

After considering various theories on the origins of people in the Americas, Kames discussed their progress, and in particular queried why the North American tribes had not advanced towards a 'maturity of society and government' as other nations had. He wrote that it was not from a shortage of animals that could be domesticated, and theorised that it might have been because of low population levels. He suggested that hunters would remain hunters 'till some cause more potent than custom force them out of that state', and that wood shortages brought on by rapid population growth had led to the development of the 'shepherd-state' in the Old World. Home expressed surprise that, despite not apparently having gone through a 'shepherd-state' stage, the North American tribes had, at the time of the Spanish conquest, developed some agriculture and many lived in villages or small towns. He noted that similarly the people of Guiana were still at that time hunters and fishers but nevertheless had developed some horticulture. Home was also surprised at the difference between the people of North America and the Mexicans and Peruvians, who 'had made great advances toward the perfection of society' despite being located in the 'torrid zone', whereas people in the Old World were generally still at the level of savages (Home, 1776, v.II, 361-372). Kramer noted that this may have been the earliest reference to the absence of a herding stage in the New World (Kramer, 1967, 78).

Unusually for the time, Robertson, who was primarily a historian, based his theories on known archaeological facts. In *The History of the Discovery and Conquest of America*, published in 1777, he wrote of three stages of evolution: savagery (with no writing, metals or domesticated animals), barbarism (with metals and animal domestication) and

civilisation. Robertson believed, as other Enlightenment scholars did, that the evolution of human society was of primary importance (W. Robertson, 1777). His work, along with others, had placed lithic cultures (together with those using shell, bone and other hard substances) before the use of bronze and iron (Hoebel, 1960, 649). Robertson condemned the apparent inactivity of some of the American tribes, comparing them to 'the other animals', with no fixed abode or dwellings to shelter them from the inclemency of the weather. He wrote that these tribes had not made provision to ensure the security of their food supplies:

> 'he neither sows nor reaps; but roams about as led in search of the plants and fruits which the earth brings forth in succession; and in quest of the game which he kills in the forests, or of the fish which he catches in the rivers'

Robertson declared that 'man cannot continue long in this stage of feeble and uninformed infancy'. He noted that most of the American nations, especially those located in 'rigorous climates', did make some efforts and took some precautions to secure their subsistence needs, qualifying this by saying that:

> 'their industry is partial …. they depend for their subsistence, during one part of the year, on fishing; during another, on hunting; during a third on the produce of their agriculture. …. they often feel the calamities of famine as severely as the rudest of the savage tribes.' (W. Robertson, 1777, 215-221)

Robertson theorised that such lack of thought for the future was the effect of ignorance and the cause of laziness, which 'accompanies and characterizes man in every stage of savage life'. He noted that pre-contact Americans subsisted mainly by hunting and fishing, and had what he described as 'an imperfect conception of any species of property'. He suggested that although all pre-contact people in the Americas would come under the general classification of 'savage', the advances in subsistence procurement were different through the continent (W. Robertson, 1777, 215-221). Robertson placed Mexico and Peru, with intensive horticulture and urbanism, in the first stage of a transition from barbarism to civilisation (Hoebel, 1960, 650). Robertson also recognised that mothers who were living a mobile lifestyle could not easily rear another child until the first has become independent (W. Robertson, 1777, 219).

In *Outline of the Intellectual Progress of Mankind (Sketch for a Historical Picture of The Progress of the Human Mind),* published in 1795, de Condorcet presented ten stages in his concept of the progress of humankind, the last stage being his vision of the future. The first three stages, in which humankind moves from tribal to pastoral (in which he envisaged people were already leading a sedentary lifestyle) to agricultural societies (ending with the invention of the alphabet) are the stages which Marvin Harris noted appeared to interest de Condorcet the least (M. Harris, 1968, 35). De Condorcet wrote of

an ‘unfinished progress of perfectibility’ as humankind moved through these stages of development, and proposed that the progression would never be reversed ‘while the Earth remains in its current state’ (de Condorcet, 1795 [1955], 4-5). Spiegel called de Condorcet ‘the high priest of the idea of the perfectibility of man’, and noted that de Condorcet had attributed his theories to the physiocrats who had “proved” that ‘the world must advance towards perfection’ (Spiegel, 1955, 521). Marvin Harris described de Condorcet’s work as ‘the Enlightenment’s culminating attempt to interpret sociocultural evolution in terms of increments in the rational content of thoughts, customs and institutions’. Harris also suggested that de Condorcet’s work had an indirect effect on both Spencer and Darwin through its influence on Malthus’ 1798 *Essay on the Principle of Population* (M. Harris, 1968, 35).

Pastoralists were not generally included in the stage development models developed by later scholars, although they had been frequently referred to in the models of the 18th century scholars. There has been some ambiguity in the use of the term ‘pastoralist’ which, over time, has been used to refer to nomadic pastoralists, transhumant pastoralists and also to what are basically settled farmers or agriculturalists. In current usage, nomadic pastoralists do not normally have a settled base, whereas transhumant pastoralists generally take their stock seasonally to pasture from a fixed location where some of the community may remain, and the majority of agriculturalists live in one location for at least several years. However, earlier scholars did not make these sorts of distinctions.

Not all scholars in the Enlightenment period theorised that humans developed through different stages. Buffon (1748), for example, wrote that there were many reasons for the apparent differences in people in the different countries of the world. He suggested that climatic and dietary variations, as well as differences in manners and customs, ‘produce not only a difference in sentiment, but even in the external form of a different people’. He theorised that originally there was only one ‘species’ of humans, whose form changed as they spread out over the world and whose skin colour was regulated by the climate and other conditions in the areas in which they lived (Hutton, 1821, 59, 74-75). Home theorised that there had not been one origin of humans but that different types of humans had originated in different climatic regions of the world (Home, 1776, v II).

3.4 The Enlightenment to the mid 19th Century

A detailed schema of the Three Age System was included in Thomsen's guidebook to the National Museum of Copenhagen in 1836 (Renfrew & Bahn, 2012, 28), but although providing a framework for the study of the past it was very much concerned with materials used, rather than consideration of any social or living conditions. *The Primitive Inhabitants of Scandinavia*, was published in Swedish in 1838, with the English translation of the 3rd edition, updated by Nilsson, being published in 1868. In this, Nilsson posited that every nation had to pass through four stages 'before attaining its highest social development', although in fact that was the fourth stage in his categorisation. The first stage, 'the savage' was compelled to hunt and fish to survive. Nilsson theorised that as those people learnt to store food and to keep some calves or fawn they became herdsmen, or nomads. In this stage they hunted less. He posited that there were various kinds of nomads, some with fixed habitation through all the seasons, others with winter housing and moving with tents in summer, and some with no fixed abode, 'living in movable huts or sheds on wheels, drawn by cattle, or in tents stretched on poles, and carried on the back of their cattle'. In this stage, Nilsson envisaged a patriarchal style of government with the beginnings of the arts and sciences. He wrote that as the population increased, they began to develop agriculture. They then became agriculturalists, who had permanent housing and developed a sense of inheritable property. Nilsson posited that in this stage, written language developed in order that landowners could mark their property. The population also developed money, in order to be able to trade without leaving their property, and the money and writing enabled them to move to the fourth stage, civilisation, and 'attain the highest degree of culture and the highest stage of civilisation' (Nilsson, 1838, lxiv-lxx).

As had been the case in the Enlightenment period, not all 19th century scholars were convinced that humans had progressed through stages from savagery to civilisation. Richard Whately, Professor of Political Economy at Oxford (and appointed Anglican Archbishop of Dublin in 1831), gave a series of introductory lectures on Political Economy in 1831 in which he questioned whether humans had progressed from a state of savagery or whether they had always been civilised (N. C. Gillespie, 1977, 41). He also wrote that descriptions of 'savages' as living in a state of nature were erroneous, as he posited that the natural state of humans was one in which they were expanding themselves and working towards progressive improvement (Whately, 1847, 116-117). Whately's Lecture 5 was entitled 'The Origin of Civilized Society'. In this, he expounded his thesis, that:

> ‘civilized Man has not emerged from the savage state; – that the progress of any community in civilization, by its own internal means, must always have begun from a condition removed from that of complete barbarism; out of which it does not appear that men ever did or can raise themselves.’

Whately acknowledged that his views apparently disagreed with the hypotheses of other writers, but suggested that they only ‘*apparently*’ held those views, because there was no proof that humans had actually progressed by gradual changes from a state of complete barbarism to a civilised state ‘without instruction and assistance from people already civilized’. He also noted that there were savage tribes around the world who had had occasional, but no settled, contact with civilised people who continued ‘in the same uncultivated condition’ (Whately, 1847, 101).

Biblical and other historical sources were frequently used by Whately as evidence to support his theories. Accounts in the Book of Genesis suggested that humans had been created as different from animals, and had received divine instructions and communications on how to provide for themselves. To Whately, historical records suggested many cases where a rise from a savage to a civilised condition had not occurred, and none which showed that it had. Whately noted that there were ambiguities in the use of the description ‘savage’, and that there were different levels of communities of ‘savages’, ranking Indigenous New Zealanders higher than Indigenous Australians, for example. He theorised that many people could have been misled by the writings of the Greeks and Romans, who had used the term ‘barbarian’ for all nations other than their own, whereas in fact there were several groups who were actually living in far from a savage state, with agriculture, domesticated animals, cavalry and metalworking (Whately, 1847, 102-107). At this point Whately contradicted himself, and wrote ‘I would admit, that, in this sense, men may advance, and in fact have advanced, by their own unassisted efforts, from the savage to the civilized state.’ He went on to say that when allowance had been made for the sources of inaccuracy:

> ‘there will be no reason, I think, for believing that there is any exception to the positions I have here laid down: the impossibility of men’s emerging unaided from a completely savage state; and, consequently, the descent of such as are in that state (supposing mankind to have sprung from a single pair) from ancestors less barbarous, and from whom they have degenerated’ (Whately, 1847. 102-107).

One of the arguments Whately used to support his theory of the descent from civilisation was the supposition that ‘savages’ had retained from their supposedly superior previous condition some of the skills which were most useful for their survival. He also cited Abyssinia as a nation which was at that time moving from a comparatively civilised

condition towards barbarism, caused by the constant incursions of their non-Christian neighbours, the Galla. Whately added that whatever the cause of the barbarisation, if they had not sunk too deeply they could, under favourable conditions, be expected to rise again and become more civilised than they were before. He did, however, posit that 'there is a stage of degradation from which it *cannot* emerge, but through the means of intercourse with some more civilized people' (Whately, 1847, 107-109). Whately raised these issues again in 1855, in lectures to the Young Men's Christian Association. His views were reinforced by the Duke of Argyll (Argyll, 1869), and in 1867, at a meeting in Dundee, Sir John Lubbock presented opposing arguments. The responses of Lubbock and his fellow evolutionists to the theory of cultural degeneration demonstrated the use of bias and evasion in their defence of their position in a similar way to the theological opponents of evolution (N. C. Gillespie, 1977, 40-41).

In the mid-nineteenth century, political economists took up the idea of stages in relation to the economic development of countries. Kramer noted that Friedrich List, for example, had proposed five main degrees of the economic development of nations – savagery, pastoralism, agriculture, agriculture and trade, and agriculture crafts and trade – separating agriculture and pastoralism. Kramer also noted that List's theories were incorporated into the Marxist politico-economic systems, particularly by Engels (Kramer, 1967, 59).

In the Preliminary Remarks chapter at the beginning of *Principles of Political Economy* (1848), Mill outlined the differences between nations and the stages through which humans develop. He wrote of the way that contemporary hunter-gatherer people lived, in rough huts 'abandoned at an hour's notice' and with no storage of food or other commodities. He commented on their scant possessions and the way they did not make much use of their land, noting their condition as 'the state of greatest poverty in which any entire community of human beings is known to exist'. Mill proposed that the first significant advance from this condition was the domestication of animals, which gave rise to the 'pastoral or nomad state'. Mill considered this condition as not only more attractive itself but also more conducive to further progress, with the possibility of greater accumulation of wealth. Mill envisaged the nomad state allowing time for leisure, with a desire for better conditions leading to the development of skills in producing woollen clothing, working leather and metal. He attributed the beginnings of speculative science and of astronomical observations (by the shepherds of Chaldea) to this stage (Mill, 1848, 9-11). Mill theorised that the transition to agriculture was not an easy one, but was something that happened spontaneously as the population of both humans and cattle increased. He wrote that at a later time a similar increase in numbers caused nomad

populations to invade agricultural areas and, when repelled by them, were themselves forced themselves to turn to agriculture. Mill also suggested that the subsequent progress of humankind took longer than might be expected, because, although the quantity of food which could be produced through agriculture was potentially much greater than a purely pastoral community could produce, it required a considerable increase in labour, and there was not enough surplus to support other groups of people such as labourers and artisans (Mill, 1848, 11-12).

After the development of agriculture, Mill envisaged that there would be governmental control and taxation of resources. He wrote that the first of the government appropriations appeared in Asia, where the wealth was unevenly distributed but where public utilities were constructed. Mill reported that the early agricultural communities in Europe had no taxation as there was no government, and land was continually divided up between the families in the community, with families being fairly self-sufficient. He theorised that in some European cases, particularly those in favourable climates on the shores of inland seas, people made great advances in intellectual culture and the acquiring of knowledge, and if their land was no longer productive, they became traders. Increasing population in these agricultural communities led to frequent conflicts and the forceful acquisitions of new lands, in some cases with concomitant slavery, and this led, eventually, to the development of the Roman Empire. Mill also mentioned the feudal systems of the Middle Ages, followed by modern industrial communities. He noted that all the stages of development were still extant and the differences in production and distribution of wealth were caused in part by inequality in the distribution of physical knowledge (Mill, 1848, 14-20).

3.5 Concepts of property and ownership

Scholars in the Enlightenment and the 19th century, such as Rousseau, Ferguson, Millar, Smith and Spencer, often used notions of the development of awareness of ownership and property in their theories on the development and progress of societies. Rousseau, for example, posited that civil society was actually founded by the first person to enclose a piece of ground and claim ownership of it (Bromwich, 2002, 288). Millar also explicitly linked the beginnings of political control with the accumulation of wealth and the creation of hereditary private property in the agricultural and pastoral stages (M. Harris, 1968, 32).

In Book V of *An Inquiry into the Nature and Causes of the Wealth of Nations* Smith discussed the expenses of defence through the different stages of development. He wrote

that in nations of hunters, 'the lowest and rudest state of society', all men were warriors, with no-one to provide for them while they were at war and with their armies numbering less than three hundred. Similarly every man was a warrior in nations of shepherds, 'a more advanced state of society' but who still usually had no fixed homes, living in tents or covered wagons. In these societies of shepherds, as their animals used up all the available fodder in one area, the whole community moved to another area. The section of Smith's writing about societies of shepherds also highlights the 18th century's concerns about ownership and property. Smith went on to write that even in its most rudimentary state, agriculture necessitated some sort of habitation 'which cannot be abandoned without great loss'. This meant that in time of war only men of military age who were not currently involved in planting or harvesting were able to be spared to go into battle, and they would usually not need to be paid if the duration of the conflict was short, only when conflicts became more protracted. If warriors were not willing to entrust the defence of their animals to the elderly, women and children, the whole community went to war together, with armies numbering up to three thousand or more. (A. Smith, 1776, 153-155).

Home devoted a chapter of his *Sketches of the History of Man* to the development of a sense of property. He wrote 'among the senses inherent in man, the sense of property is eminent'. Home suggested that the development of a sense of property had been gradual, 'from its infancy among savages to its maturity among polished nations'. He theorised that 'things destined by Providence for our sustenance and accommodation, were not intended to be possessed in common', and that it was likely that even in very early times individuals had hunted for themselves and their families alone (Home, 1776, vI, 91-92).

In Lecture 6 of his *Introductory Lectures on Political Economy*, Whately had stressed that the recognition and security of property were an essential criterion for the advancement of a society. He proposed that although security of property was the most essential point, a knowledge of some of the arts and the division of labour were also important (Whately, 1847, 121-122).

3.6 Conclusions

As discussed through this and earlier chapters, the adoption of a sedentary lifestyle as societies moved along what was regarded as an automatic trajectory from savagery to barbarism and eventually civilisation appears to have been a self-evident "fact" for early scholars (with the exception of those such as Whately who considered some communities

were descending from civilisation to barbarism) and therefore the processes involved in becoming sedentary were not considered in detail. This tradition, coming from the short time-span view of the human past, of accepting an automatic progression appears to have continued through into the 20th century, despite the changes in our understanding of the time-span of human cultural evolution. It may also have perpetuated the view that becoming sedentary was an almost instantaneous process rather than, as is now becoming accepted, a process which usually took place over a long period of time as communities moved from being completely mobile through periods of reduced mobility until eventually they settled in one location where the majority of the population resided "continuously". During the Enlightenment period, some scholars, such as Millar, theorised that humans had not become settled until they had developed a sense of proprietorship of land and possessions. This theme was also taken up by later scholars.

Assumptions by scholars in the Enlightenment period that the transition to sedentism was an obvious outcome of the "progression" of humankind also contributed to ambiguity in later writings. As consideration was not given to the period of transition or the way in which people adopted a sedentary lifestyle, different people used the similar phraseology in differing ways to illustrate their own positions in relation to a particular community at some point in its transition to a fully residentially-stable state. As noted above, there have also been differences in the way the terms "pastoralism" and "pastoralists" have been used, which have caused further ambiguities to appear in comparative discussions in later scholarship. The terms were often used in many of the early writings to refer to transhumant pastoralists or stationary agriculturalists, rather than nomadic pastoralists. Some of these references to transhumant pastoralists or stationary agriculturalists in the stage theory writings appear to have been later taken to mean nomadic pastoralists.

Although it is sometimes considered (e.g. M. Harris, 1968, 29) that the so-called three-stage theories were only developed in the 17th-18th centuries, it can be seen that scholars as far back as Aristotle were constructing theories on the stages in which humans "progressed" to, or in some views, descended from civilisation. However, it was philosophers writing in the Enlightenment period who set the idea of unilinear staged progression firmly in the terminology of later scholars. In general, these writers viewed progression through various numbers of stages as an almost absolute and self-evident natural progression, with those societies which were still living as hunter-gatherers or nomadic pastoralists viewed as not yet having been able to achieve the subsequent stages. As scholars generally agreed on this self-evident progression, and there was very little discussion of whether or not this view was correct, in that time period there were only minor ambiguities in the definition of the various stages.

The foundations for the way in which scholars viewed the “progression” of humankind and the establishment of what the early scholars regarded as “civilisation” developed during this period. This unilinear progression concept affected not only archaeological thinking but also permeated throughout the social sciences. Anthropologists writing more than a century and a half later were still using the concept.

Chapter 4: The 19th century from the 1850s

"archaeologists have long debated and discussed why people began living in settled communities" (Mithen, 2007, 705)

4.1 Introduction

The "stage" views of the earlier scholars continued in philosophical and other writings from the mid-19th century to its end, and curiously there was little change in the way the transition to a sedentary lifestyle was perceived, even though the known time-depth of human cultural evolution had increased substantially. The "self-evident" attitudes persisted, with the concomitant lack of consideration of the processes involved, suggesting that the progressionist model continued to be dominant. One consequence of this was the lack of attempts at rigorous definition of what constituted a sedentary community, which has led on to the ambiguities evident in the study of sedentism today. Although the majority of the writings relating to the adoption of a sedentary lifestyle continued to use stage theory ideas, new issues and concepts in relation to human lifestyles both past and present were beginning to be introduced during this time. There was, however, no clarification of the ambiguities which had started to arise before this time. In addition, more ambiguities began to enter the scholarship as these new issues were raised and new concepts introduced.

During this period, scholars generally still did not consider it necessary to elaborate their explanations for the ways in which the changes came about. Neither did they tend to examine the processes involved in those changes, nor the timescales involved although they did discuss necessary preconditions such as the concept of land ownership. Rather, scholars tended to write as if there was some sort of switch which could be turned on to effect the changes in a community as it decided to settle, rather than instituting detailed research into what might have been involved or why such changes were made. Attempts to accurately define the idea of progress and link it with philosophical and scientific theories of development only began in the latter half of the 19th century, having not been achieved by the earlier philosophers. Ginsberg noted that by the end of that century no scientifically proven law of progress had been established, but general vague concepts were used as a basis for social and political reform movements (Ginsberg, 1953, 1-2). Theories on past lifestyles were generally presented as facts in this period, despite the lack of evidence to support such declarations.

Towards the end of the 19th century, anthropological research was becoming fashionable, and more first-hand accounts began to be written by the researchers themselves, rather than by academics remote from the issues they were dealing with. Herbert Spencer was a notable exception, in that he did not gloss over these issues, with many references in his books to changes in the residential status of humans in the past, and therefore part of this chapter is devoted in some detail to his works. Spencer was a prolific writer, and he appears to have given considerable thought to the stages of human culture, the ways in which humans changed their modes of living and the ways in which they developed settled communities. His writings displayed changes in his thinking from the earlier to later works, from *Social Statics; or The Conditions essential to Human Happiness specified, and the first of them developed*, first published in 1850, which Peel (Peel, 1972, xix) termed as naïve compared with his later work. In a preface to a later reprint (1877), Spencer himself wrote that, in relation to some parts of the work as originally published, 'I have allowed the work to remain on sale; though in some respects it does not represent my present view'.

Darwin's work, particularly the 1859 publication of *On the Origin of the Species by Means of Natural Selection*, is often considered as representing a turning point in intellectual thought in the 19th century. Nevertheless, as the main focus of his scholarship was physical evolution, rather than socio-cultural evolution, his work will not be covered in this thesis. Simpson noted that, although Darwin did, in *The Descent of Man* propose that 'evolution might sometimes have a "downward tendency"' in relation to human evolution in a cultural context, even in that work Darwin had discussed the prevailing tendency of progress from "lower animals" to "civilised man" (Simpson, 1974, 228). Later scholars in the humanities have tended to consider that social evolution derives from Darwin's work, but, as Freeman noted, it actually derives from Spencer, who was not using the same intellectual model as Darwin (Freeman, 1974).

4.2 Herbert Spencer

There are differing scholarly opinions on Spencer's contributions to the theory of evolution and the history of evolutionary thought. Marvin Harris, for example, proposed an 'evolutionary synthesis' in the works of Spencer and Darwin in the formulation of theories of evolution (M. Harris, 1968, 113). Harris also wrote that it was Spencer, not Darwin, who had the greater responsibility for having greatly reduced the explanatory power of cultural evolutionary theory by merging it with racial determinism and over-emphasising the importance of hereditary factors as the cause of behavioural patterns in

modern human populations (M. Harris, 1968, 129-130). Freeman disputes Harris's suggestion of an 'evolutionary synthesis', highlighting the differences in the backgrounds to the works and theoretical stances of Darwin and Spencer (Freeman, 1974). Andreski suggested that Spencer's contribution to social morphology was to introduce structural complexity as the unitary semi-quantitative basis of classification. Spencer did not write much about the impact of technology on society, and Andreski posited that this might have been because he was interested in social evolution 'as an exemplification of an omnipresent cosmic process' rather than for its own sake (Andreski, 1971, 16-17). Marvin Harris described Spencer as 'the most effective scientific spokesman of early industrial capitalism', whereas he viewed Marx as 'the most effective scientific spokesman of revolutionary socialism' (M. Harris, 1968, 125).

In line with the contemporarily generally accepted stage theories, Spencer argued that a savage stage of human nature was a prerequisite before civilisation could develop. He wrote that the 'aboriginal man' needed a constitution which was adapted to the work that had to be done, together with a 'dormant capability of developing into the ultimate man when the conditions of existence permit' (Spencer, 1850, 410-411). In *The Social Organism* (1860), Spencer used analogies with cells of living bodies to describe the first stages of human societies, again on stage theory lines. In what he referred to as 'the lowest races' such as the Bushmen, Spencer posited that there was only an incipient aggregation, with single families or two or three families moving about together and only an irregular connection with associated groups. Spencer wrote that this was nothing more than an undifferentiated group of individuals which formed the germ of a society, just as a homogeneous group of cells form the initial stage of animal and vegetable organisation. He also postulated that traces of social structure can be seen in larger and more permanent groups of savages 'not quite so low', with a more or less government-style organisation. Spencer posited that while all the men were still warriors and hunters, only some of them would have been included in councils of chiefs, and only one would have had supreme authority, and he likened this stage to composite forms of the hydra. In cases where the topography of an area presented obstacles to migration to distant regions, separate tribes could not wander in different directions, and thus small communities were held in closer contact. Spencer theorised that this would eventually result in them uniting into a nation, and likened it to increasing complexity in marine animals (Spencer, 1972, 61-62).

In *The Principles of Sociology*, Spencer proposed that as soon as a community acquired permanence, the actions and reactions of its members would affect the whole community. Conflicts within small, wandering, unorganised groups would not lead to any permanent changes. However, once these conflicts resulted in the formation of chieftainships, they

led to political organisations and then to wars, which would change the community irrevocably (Spencer, 1876, 13). In *First Principles*, Spencer wrote that integrative changes are amply demonstrated in the social organism. In uncivilised societies this is shown when wandering families 'such as those of the Bushmen' join into tribes of considerable size. The subjugation of weak tribes by stronger ones leads to a further increase in size. He wrote that while such combinations in 'aboriginal races' are continually being formed and then broken up, among 'superior races' they become relatively permanent. Spencer theorised that as these unifications were repeated on a larger scale, with increasing stability and increasing consolidation through the process, the original lines of demarcation between different groups would be destroyed (Spencer, 1864, 254).

Spencer also discussed his view of the Law of Evolution in the social structure of humanity in *First Principles*. In his opinion the progress of civilisation displayed the change from the homogeneous to the heterogeneous. The first and lowest stage of society is comprised of a homogeneous group of individuals, with the only distinctions being the difference in roles of males and females. In this stage, each family is self-sufficient and only needs others for companionship, defence and aggression. However, Spencer posited that very early in the course of social evolution, leaders begin to develop. As separate wandering families advance to becoming a nomadic tribe, a kind of chieftainship arises from the strongest and most cunning. At this stage there is no socio-economic differentiation. Spencer described the progress from the first stage of a homogenous primitive tribe as a continuing development towards an 'economic aggregation of the whole human race, growing ever more heterogeneous' (Spencer, 1864, 276-279).

In a chapter on the instability of the homogeneous in *First Principles*, Spencer noted that even among 'savages' there are small specialisations which arise from individual personal abilities, whereas large industrial divisions in societies do not come into being until differences in external circumstances are established. Spencer pointed out that members of nomadic tribes are not permanently exposed to peculiar local conditions. A stationary tribe which occupies only a small area has no marked differences in the local conditions of its members through the generations and thus there is no definite economic differentiation. However, a community which has spread out over a large area and has become so settled that its members live and die in their respective districts, would exhibit socio-economic differentiation and craft specialisation (Spencer, 1864, 343-344). In the same section, Spencer wrote that people who live in a dispersed situation continue to hunt or practise agriculture, or for those close to the sea, maritime occupations. He suggested that the inhabitants of a place which had been chosen as a place of periodic assemblage

would become traders, and from that a town would grow. As these social units adapted to their respective functions, Spencer saw ‘a progress from uniformity to multiformity caused by unlike incidence of forces’, with local adaptations multiplying in the process of social evolution. Differences in local conditions would lead to agricultural specialisation, and Spencer theorised that later this would lead to industrial specialisation (Spencer, 1864, 343-344).

As did many other scholars of his time, Spencer considered the beginnings of craft specialisation and the way in which it led to a settled lifestyle. One person with a talent for making weapons would make weapons for his companions, who were hunters and warriors, in return for some kind of reward. This not only gave the individual the opportunity to improve their skills but also increased their status. Others in the group would gradually lose their own skills in weapon-making, and the diversity in occupations would gradually increase, leading to a barter system. Spencer posited that such a system could not produce a continuing distribution of functions in an unsettled tribe, and that where such specialisations were taking place the community would settle permanently and increase in size with each generation (Spencer, 1864, 365-366).

Spencer wrote that there was one important truth which must be noted, that the earth’s geological and meteorological changes had caused ‘perpetual emigrations and immigrations’ as localities became more or less habitable. These movements of people took them into environments in which they encountered unfamiliar conditions. Spencer theorised that social evolution was not possible in extremely cold climates, where all the energy was used to preserve body heat, with little left to rear children, which meant that population numbers remained too low for anything beyond ‘incipient social existence’. Although he believed that extreme heat also impeded vital actions, Spencer wrote that there was a compensating energy in the cooler parts of the day which allowed human races adapted to such climates to progress, albeit with some indolence compared with Europeans. He noted that the earliest recorded civilisations arose in tropical or sub-tropical regions. Spencer also commented that Tahiti, Tonga and the Sandwich Islands had, at European contact, ‘reached stages of evolution which were remarkable considering the absence of metals’ (Spencer, 1876, 17-21). Spencer reasoned that humans tend to adapt to living in a particular region, and that climate and food which suited an indigenous population in one area might not suit an incoming group. When members of an incoming society have to live with another group, they tend to form enclaves, and Spencer posited that, in a similar fashion, people of similar occupations tended to congregate in the same locality (Spencer, 1864, 385-386).

To some extent Spencer appeared to accept that there is not always a linear progression from a mobile or nomadic lifestyle to a settled one, and under some circumstances settled people could become nomadic. He theorised that mountain tribes had not been able to be conquered because of the difficulty in reaching them, and noted that people living in deserts were difficult to consolidate because the ease of escape and their ability to live in sterile areas hindered their social subordination. Spencer once again stressed the importance of the nature of the landscape, particularly in relation to nomadic peoples. He suggested that even if the nomads in a region were exterminated, the area would be repeopled by refugees from neighbouring settled societies, and those incoming people would become nomadic, adapting to fit the new environment. Spencer wrote that in order for the habits of hunters or nomads to be changed into what is necessary for a settled life, the area occupied must be one 'within which coercion is easy, and beyond which the difficulties of existence are great', such as Egypt (Spencer, 1876, 25-28). In this Spencer appears to recognise that adopting a sedentary lifestyle is not a simple, quick and easy process or one that people with mobile lifestyles would necessarily choose to adopt.

The degree of heterogeneity of a landscape also influenced the social progress of its inhabitants according to Spencer, who suggested that, if other factors were equal, localities that were uniform in structure would be a hindrance to the development of industry and the arts of life. He cited Central Asia, the central regions of both North and South America and Central Africa as lacking in any history of an advanced indigenous civilisation. In contrast, he noted that areas such as the Nile Valley, Babylonia, Assyria and Phoenicia, although not physically complex, are complex in relation to the surrounding territory and they all have access to water, usually a precursor of civilisation. At the other extreme, Spencer noted that the area of development of Greek society was 'varied in its multitudinous and complex distributions of land and sea, in its contour of surface, in its soil'. He theorised that the differences in the development of civilisation might be primarily due to dissimilar amounts of interaction with other societies, notwithstanding that this interaction was also dependent on an area's accessibility by land and sea. Spencer theorised that agricultural skills must be well developed before less fertile areas can support populations large enough for civilisation. Since such skills generally only developed as communities increased in size, it was necessary for there to be communities living in highly fertile areas so that strategies could be developed for dealing with the less productive areas (Spencer, 1876, 28-30).

According to Spencer, the quantity and character of vegetation affects the progress of development of the local inhabitants. He wrote that the lack of useful plants or trees with which to build houses in areas of extreme cold or ice, such as the Arctic and Tierra del

Fuego, was ‘an insurmountable impediment to social progress’. Spencer posited that although Australia had a climate that was generally favourable, the scarcity of edible plants, with the land supporting only one person for every sixty square miles, was partly the reason the inhabitants had remained at the ‘lowest level of barbarism’ as they could not approach the population density necessary for civilisation (Spencer, 1876, 31-34). Availability of faunal resources also had a strong influence on social growth, according to Spencer. In areas where there was abundant game, partially-nomadic hunters were an impediment to agriculture, population increase and industrial development. The reverse was true for some Polynesians, where the absence of substantial faunal resources forced the local populations into developing agriculture, with its ‘concomitant settled life, larger population, and advanced arts’ (Spencer, 1876, 34). Spencer also wrote that where pastoral society has played an important part in human progress, it could be seen that the indigenous fauna had been a significant factor in developing and moulding social union. The pastoral life of ‘the three great conquering races in their original habitats’ would not have been possible without herbivores suitable for domestication, but this lifestyle was inconsistent with the development of the type of larger settled societies which Spencer wrote were needed for ‘higher social relations’ (Spencer, 1876, 34-37).

Natural phenomena and factors such as the presence or absence of minerals can also affect the way in which a society will develop. When asked the questions, “How does it happen that so many tribes of savages have made no manifest progress during the long period over which human records extend?” “And if it is true that the human race existed during the later geologic periods, why, for 100,000 years or more, did no traceable civilization result?”, Spencer’s response was that taking external factors into account, the combination of the presence of factors favourable to the development of civilisation and the absence of unfavourable ones is rare, and the exposure of primitive social groups to adverse changes caused repeated losses of those advances which had been made (Spencer, 1876, 38-41).

Spencer suggested that a lack of awareness of the future was in part responsible for the laziness of ‘primitive man’, which had hindered their progress. Despite this, he conceded that some ‘savages’ did display persistence, in anticipation of future benefits, in the manufacture of things which did not in his view require much physical effort, such as making arrows or producing implements. Spencer suggested that such ‘improvidence’ was both a cause and a consequence of an undeveloped proprietary sentiment. He also wrote that ‘uncivilized men’ were prone to thoughtless gaiety and inattention to the threat of future problems, which again hindered their progress (Spencer, 1876, 61-67). Different people have different emotional traits which affect the way they form groups and thus the

way in which they live. Some people, he noted, such as the Mantras from the Malay Peninsula, needed freedom, and lived as if they were the only people in the world, separating from each other if they were in dispute. He commented that this trait was also seen in some nomadic people, such as the Bedouin, who have a high regard for both personal and national liberty. In his view, small groups of primitive people, living on wild food in a dispersed setting, were accustomed to following immediate desires. Spencer theorised that it was only when local conditions forced those groups to increase their numbers in a small area that they could gain the sociality necessary to check unrestrained actions, and then progress on the trajectory of social evolution (Spencer, 1876, 68-71).

In another instance demonstrating that societies do not always follow one trajectory from savagery, Spencer described well-known collapses of civilisations. He suggested that some of the tribes 'known as lowest' exhibit social phenomena which were not due to their current situation, but which were remnants of a time when their social state was higher than it then was. Interestingly, in a divergence from the views on Australian Aboriginals widely held at the time, he cited Australian marriage customs and other practices such as tooth ablation and circumcision as an example, explaining that they must have come from a time when there was some unity and subordination to a common rule in those societies (Spencer, 1876, 106-110).

In *Principles of Sociology*, in a chapter entitled 'Social Types and Constitutions", Spencer tabulated his classifications of what he termed simple, compound and doubly compound societies, stating that the great civilised nations, including ancient ones, needed no tabulation as they fell mainly under one heading – trebly compound. He based his classifications on a variety of sources, including accounts of travellers, and indicated that the classifications were only approximations. According to his classification:

- Simple societies have four divisions – headless, occasional headship, vague and unstable headship, and stable headship. Each of these divisions are broken down into peoples who are nomadic (or hunting), semi-settled or settled.
- Compound societies have three divisions – occasional headship, unstable headship and stable headship. Again each of these divisions are broken down into peoples who are nomadic (or hunting), semi-settled or settled.
- Doubly compound societies also have three divisions - occasional headship, unstable headship and stable headship. By this point there are only two sub-divisions: semi-settled (of which Spencer gives no examples) or settled (Spencer, 1876, 569-574).

Spencer emphasised that it is not always easy to determine which category a society belongs in, both because there are many transitional stages in evolution and because there are sometimes other people in the groups with different ancestry, such as slaves or invaders. The 'simple' category contains societies which form a single working whole, not subject to any other group, and of which the different parts cooperate, with or without a regulating authority, for some public functions. The 'lowest' of these groupings are small, wandering entities who live on wild food, sparsely distributed in forests, barren tracts or sea-shores. Spencer noted that if circumstances allowed these small simple societies to live in a settled situation without conflict, they might not have chiefs. He wrote that it was reasonable to infer that the change from the hunting life to the pastoral, and from the pastoral to the agricultural, supported population increases, and the development of political and industrial organisations and the arts, although 'these causes do not of themselves produce these results' (Spencer, 1876, 569-596).

This categorising of compound societies included societies which had moved to some degree to having sub-leaders under a supreme leader. The stability of the leadership in Spencer's structure referred to the leadership of the society as a whole and not of the component groups, and the leadership becomes more stable as the group becomes more settled. Spencer suggested that nomadic life made it difficult for the leaders of the component groups to be kept subordinate to the overall leader. He wrote that completely settled compound societies are mostly characterised by 'division into ranks' … 'by buildings of some permanence clustered into places of some size' (Spencer, 1876, 573). The doubly-compound societies were all completely settled, with stability of political leadership and considerable progress in knowledge and the arts (Spencer, 1876, 574-576).

Spencer's scholarship in relation to residential status was not considered in depth by his contemporaries, nor by many later scholars. In his introduction to *Herbert Spencer: Structure, Function and Evolution*, Andreski noted that, at the time when the progression from simple societies to complex ones was accelerating and industrial civilisation was taking over everything from tribes to larger traditional kingdoms, evolutionism became considered as an 'antiquated nineteenth-century pre-conception' (Andreski, 1971). Kardiner & Preble suggested that it was Spencer's attempts to demonstrate the orderly structure and workings of nature and the universe both on a large and a small scale that made him 'a hostage of the future', and that 'history has inevitably sacrificed him' (Kardiner & Preble, 1961, 37). Andreski suggested that Spencer has not been considered as an important thinker because he articulated earlier and more clearly what were in fact being claimed as discoveries by the late twentieth century theorists (Andreski, 1971, 11).

4.3 The mid-Nineteenth Century to 1900

In 1856, in *The National System of Political Economy*, List had catalogued five economic stages through which a developing nation would normally pass. These were the wild or uncivilised stage, the pastoral stage, the agricultural stage, the agricultural-manufacturing stage followed by the agricultural-manufacturing-commercial stage in which all economic forces were harmoniously developed (Spiegel, 1955, 520).

The Ohio Mississippi Valley mound builders' constructions were considered by Lyell, who posited that the large number of mounds indicated that the area had been occupied for a considerable period of time by a settled agricultural population, whose 'considerable progress in civilization' meant they had needed extensive fortifications and large temples for their religious rites. Lyell also noted that at the time of European contact the area was forested, and the only inhabitants then were mobile hunters with no apparent traditions connecting them with their 'more civilised predecessors' (Lyell, 1863, 31-32). The majority of the second chapter of *The Antiquity of Man* was devoted to discussions of lake dwellings, in particular those in Switzerland and Ireland. The Swiss huts were built on piles driven in to the lakebeds, whereas the Irish were constructed on artificial islands made by infilling of an oak frame. Lyell posited that the inhabitants of lake dwellings in different parts of Switzerland were, both before and after the introduction of metals, at different stages of development. He noted that some of the lake dwelling communities had remained static while some had advanced and improved, even though they were not geographically far apart (Lyell, 1863, 21).

Lubbock also reported on prehistoric lake dwellings of the Swiss, Irish, Scots and other European communities. He noted that not only were houses built over water in prehistoric times, but that similar habitations existed in some parts of Europe and particularly in the East Indies and South-East Asia. Lubbock reported that the water huts of the ancient Gauls were described as having been circular, of wooden construction, lined with mud and with the spaces filled with moss. Actual evidence of these dwellings had been found in the preservation of parts of the clay lining of huts which had been destroyed by fire, some of which were reported to have been circular, from 3 to 4.6 metres in diameter. Lubbock quoted Troyon's estimate of the population of a Stone Age lake settlement at Morges, in Lake Geneva, at 1244 inhabitants, and that of Neufchatel at 5,000, with the estimated population of 68 Bronze Age villages totalling 42,500. Lubbock himself stated that he believed the huts had in fact been rectangular and that Troyon's population estimates were unreliable because too many factors were unknown.

He theorised that, whatever the population and manner of construction, the security these lake dwellings would have provided would have compensated for the great investment of labour involved in their construction (Lubbock, 1865, 172-174). Continuing in his reporting of different lake villages, Lubbock suggested that the pastoral people in Switzerland 'must have reached a higher grade than a mere nation of hunters', because they had domesticated animals even in the Stone Age. He reasoned that even if animals were not common, they would not have survived a winter season without storage and shelter. Lubbock wrote that some agriculture was taking place at that time, because carbonised cereals had been discovered. Wheat was the most common (three varieties), with barley (two varieties) and millet (two varieties) also present, along with many different fruits and vegetables, some wild and some domesticated species (Lubbock, 1865, 203-206). Jordan and Zvelebil noted that it was Lubbock, in *Prehistoric Times*, who argued that the defining characteristics of the Neolithic were the growing of crops, animal domestication and the invention of pottery. They wrote that his arguments had continued to influence later scholars, particularly when taken up by Childe as part of his Neolithic package (Jordan & Zvelebil, 2010a, 46-47).

In 1869, in an article entitle *The Early History of Man*, McLennan quoted a work by Whitney which said:

> 'it is found that the primitive tribe which spoke the mother-tongue of the Indo-European family was not nomadic alone, but had settled habitations, even towns and fortified places, and addicted itself in part to the rearing of cattle, in part to the cultivation of the earth'.

Whitney had dated this tribe at earlier than 3,000 BC. McLennan, discussing the progression of humankind, theorised that the contemporarily accepted Ussher chronology must be incorrect, and wrote that 'we shall be unable to think that four or five thousand years are more than a fraction of the time which that progress has occupied'. In the same article he reported that there was archaeological evidence of humans using tools and creating arts, probably more than 20,000 years earlier (McLennan, 1869, 519-522).

McLennan set out various conditions he considered necessary before large numbers of people could live together permanently as citizens, particularly 'order' and the establishment of what he termed 'a commissariat', to enable the distribution of goods as well as knowledge. He theorised that 'the means of interchanging ideas and a capacity for common action' were necessary criteria for achieving order and an effective commissariat (McLennan, 1869, 526). McLennan also commented that tribes which stored food reserves for whatever reason were obviously a step ahead of those that did not (McLennan, 1869, 534). In *Social Evolution*, Pluciennik wrote that McLennnan's

writings had led to the decoupling of the equating of hunters, pastoralists and farmers with savages, barbarians and civilised people. Following this, Lubbock, in the *Origins of Civilisation*, had used the term 'lower races of men' and Tylor had initially used 'savage', 'wild', 'rude' and 'barbaric' interchangeably without allocating them to stages of societal change. Pluciennik noted that in this context Tylor had later characterised savagery and barbarism by the presence of agriculture and civilisation with literacy (Pluciennik, 2005, 47-48).

Writing in 1998, Trigger that noted many people in the nineteenth century believed that the Indigenous peoples of the Americas and most of the Old World had regressed to a stage of hunter-gathering before beginning their ascent towards civilisation. He noted that even as late as 1862, Wilson had described the 'Stone Age' as the base level to which human societies from time to time declined and then again ascended from, rather than as a single early stage in human development (Trigger, 1998, 38-39). Although the Duke of Argyll was often seen as supporting Whately's degenerationist views, Gillespie pointed out that his main intention had been to challenge the theoretical foundations of evolutionary anthropology and to demonstrate that the 'facts' available at the time were not compatible with the concept of primeval humans as mindless, brutish savages (N. C. Gillespie, 1977, 43-44). Marvin Harris noted that in the earlier nineteenth century, degenerationism was primarily theorised as a means of preserving the authority of Biblical history, rather than being strictly anti-evolutionary (M. Harris, 1968, 54). Argyll had used the Biblical accounts of Cain, the tiller of the ground, and Abel, the keeper of the flocks to demonstrate that the economic principle of division of labour was originally divinely taught to humans, which he acknowledged would presuppose the prior existence of domestic animals (Argyll, 1869, 31-32).

Tylor considered how the phenomena of culture, which he equated with civilisation, could be classified and arranged in evolutionary order, stage by stage. He suggested that peoples at similar stages of development throughout the world could be considered similar, and that third party reports of their conditions would only strengthen this view. Tylor agreed with Johnson that 'one set of savages is like another', in particular that they had similar occupations, tools and equipment, and posited that 'stages of culture may be compared without taking into account how far tribes who use the same implement, follow the same custom, or believe the same myth, may differ in their bodily configuration and the colour of their skin and hair.' Tylor did caution, however, that not everything that was reported, even by several people, was necessarily to be believed (Tylor, 1871, 6, 13). In 1924, Perry noted that Tylor, although generally supporting the opinion of advancement of culture, had also suggested that it might be important to study cultural degradation, but

that this suggestion had not been followed up. Perry theorised that if it had, the history of anthropological thought in the fifty years from Tylor to Perry would have been very different. Perry's thesis was that there was no evidence to support the idea that 'food producing people of lowly culture' could have independently invented the arts and crafts that they practised and they must therefore have come from some higher civilisation (Perry, 1924, 113).

In 1876, Brough Smyth, previously the Secretary of the Board for the Protection of the Aborigines in Victoria, published a report on the '*Habits of the Aboriginal Natives of Victoria*'. In its introduction, he noted that the Indigenous Australians did not wander aimlessly from camp to camp but had order and method in what they did, with all their movements being directed by the elders. Brough Smyth also noted that in some parts of Australia the Indigenous houses were 'large and well built; stout poles are used in their construction, and they are thatched with grass' (Brough Smyth, 1876 , xxx). He listed many achievements of Indigenous Australians, and noted 'the boomerang, the Womerah, the weet-weet, and message-sticks like theirs are not found amongst savages in other parts of the world'. He posited that their culture, 'in the long course of ages, if their country had not been invaded by the whites, might perhaps have resulted in civilization', although with the rider that this would only be possible in areas 'where the cultivation of indigenous or accidentally-imported roots and plants was practicable' (Brough Smyth, 1876 , xxx, liv) – a view not always shared by his contemporaries.

In 1877, Morgan explained in the Preface to *Ancient Society* that the greater understanding of the antiquity of humankind on earth, developed over the previous thirty years, had led to changing views on the relationship of savages to barbarians and barbarians to civilised people, and wrote:

> 'It can now be asserted upon convincing evidence that savagery preceded barbarism in all the tribes of mankind, as barbarism is known to have preceded civilization. The history of the human race is one in source, one in experience, and one in progress.' (L. H. Morgan, 1877, v-vi).

A little less forcefully, he began the first chapter by stating:

> 'The latest investigations respecting the early condition of the human race are tending to the conclusion that mankind commenced their career at the bottom of the scale and worked their way up from savagery to civilization through the slow accumulations of experimental knowledge.'

To this he added 'these three distinct conditions are connected with each other in a natural as well as necessary sequence of progress'. While dividing the history of humankind into three distinct stages, Morgan recognised that some of the customs and traditions of his

time were actually remnants of those from periods of barbarism or even savagery. He used this to denounce the possibility that human society had in fact degraded, rather than ascended from savagery to civilisation (L. H. Morgan, 1877, 7).

Morgan divided the stages of 'savagery' and 'barbarism' into three sub-periods, Lower, Middle and Later, with the conditions of society in each identified as Lower, Middle or Upper Status, based mainly on their economic conditions. He also divided 'civilisation' into ancient and modern stages. In Morgan's categorisation, the 'lower status of savagery' began with the origins of humanity and ended with the beginnings of fish-eating, during which time humans began to use fire and developed articulate speech. The 'middle status of savagery' ended with the invention of the bow and arrow, when humans spread over the majority of the earth's surface. Morgan cited the Australians and the majority of the Polynesians as they were when first encountered by Europeans as examples of this stage of savagery. He theorised that the 'upper status of savagery' ended with the invention of pottery, and cited some coastal tribes of North and South America at the time of their first contact with Europeans as people who were still living in the later stage of savagery. The invention of pottery was suggested by Morgan as the most useful boundary that could be drawn between savagery and barbarism. He classified as barbarians all those who had lived between the invention of pottery and the development of a phonetic alphabet. Morgan wrote that it was difficult to distinguish between the 'lower status of barbarism' and the 'middle status of barbarism' across the world. He suggested that the domestication of animals in the Eastern hemisphere and the cultivation of maize and other irrigation plants in the Western hemisphere, together with the use of adobe and stone in house construction, could be taken as the dividing line. Morgan theorised that the 'middle status of barbarism' ended with the invention of iron ore smelting. The 'upper status of barbarism' ended with the invention of the phonetic alphabet and the use of writing, when civilisation began (L. H. Morgan, 1877, 9-12).

It was also noted by Morgan that 'some of the ancient poets and philosophers recognized the fact, that mankind commenced in a state of extreme rudeness from which they had risen by slow and successive steps'. He suggested that although these poets and philosophers had perceived that progress had taken place by a series of inventions and discoveries, they had not used more decisive social arguments (L. H. Morgan, 1877, 37-38). Morgan wrote that the development of the architecture of houses demonstrated the progress from savagery to civilisation. He traced it:

> 'from the hut of the savage, through the communal houses of the barbarians, to the house of the single family of civilized nations, with all the successive links by which one extreme is connected with the other' (L. H. Morgan, 1877, 5).

The main thrust of Engels' *The Origin of the Family, Private Property and the State in the light of the researches of Lewis H. Morgan* was to highlight how in his view Morgan had been the first person 'who with expert knowledge has attempted to introduce a definite order into the history of primitive man'. Engels introduced his work with the comment that he was fulfilling a bequest to Marx, who had intended to present Morgan's research in conjunction with his own research. He also commented that Morgan had had to rely on secondary sources for his writings, whereas he (Engels) had been able to conduct his own research (Engels, 1885, 5-6, 19).

Tylor, too, classified the progress to civilisation into 'three great stages, Savage, Barbaric, Civilized'. He envisaged Stone Age 'savages' subsisting on wild animals and plants, sometimes living in tropical forests in which there was enough available food to allow small groups to live in one place year-round. He considered that humans had risen to the next stage, barbarism, when they developed agriculture, with storage facilities enabling settled villages and towns. At this time some groups were still using stone implements, but some had 'risen into the Metal Age'. Tylor placed pastoral tribes in the barbaric stage because they had a constant supply of milk and meat from their herds. He proposed that civilised life began with writing. Tylor wrote that, based on archaeology and geology, it was reasonable to infer that 'savage and low barbaric tribes' must have once lived in countries which were by civilised by his time (Tylor, 1881, 24-25).

In a new introduction to the republishing of Kidder's 1924 book, *An Introduction to the Study of Southwestern Archaeology,* Schwartz noted that when Bandelier had published works on the northern Rio Grande pueblos in the 1880s, his postulation of continuity with the past and the notion that the local indigenous people had constructed the ancient villages was considered ground-breaking. Bandelier had separated the archaeological sites into prehistoric and historical, and attempted to date them through their pottery. He had also proposed a sequence of architecture from 'the many-storied communal houses' to the 'one-story buildings of stone' (Schwartz, 2000, 4-5).

4.4 Concepts of property and ownership in the later 19th century

In a chapter entitled 'The Right of Property' in a book written to show the principles and rules by which Greek and Roman society was governed, Fustel de Coulanges discussed the way in which the concept of private property was an integral part of the religious beliefs of that time. In referring to the hearth, he used the phrase 'this altar is the symbol of a sedentary life; its name indicates this'. In his thesis, once the hearth was established,

it was connected to the god of the family and was only permitted to be moved under dire circumstances. Fustel de Coulanges wrote that the hearth was established,

> 'with the thought and hope that it will always remain in the same spot. The god is installed there not for a day, not for the life of one man merely, but for as long a time as this family shall endure…'.

This led to the concept of domicile, and to the family remaining as permanently settled on the land as the altar itself and, as a corollary, that the whole family must be born and die in that place. Fustel de Coulanges reported that even when the Greek and Roman tribes had built cities, their houses, although closer together, were not contiguous because their sacred enclosures meant that one wall was not able to be common to two houses or those sacred enclosures of the gods would disappear. Roman law had required 2.5 feet (0.76 metres) of free space between houses, consecrated to the god of the enclosure (Fustel de Coulanges, 1864 , 61-63).

Spencer theorised that it was impossible for 'the savage' to have an awareness of individual possession, which could only be gained by experience of the pleasures which possession confers, passed on through successive generations. Spencer noted that primitive people had little to accumulate. However, once they had adopted a pastoral lifestyle they increased their possessions through breeding of stock. Whilst they remain nomadic they have difficulty finding fodder and their flocks are subject to predation both from wild animals and from their enemies. Spencer posited that it was only when agriculture had been adopted and land tenure changed from a tribal basis to individual families that there would have been an opportunity for developing a sense of ownership (Spencer, 1876, 68). In a chapter in *Social Statics* entitled 'The Right to the Use of the Earth', Spencer had theorised that, given a race of people born equal and with similar claims pursing what they want, it 'unavoidably follows that they have equal rights to the use of this world'. They each would have freedom to do what they wanted, provided they did not infringe on the freedom of others or prevent others from similar use of the earth. Spencer theorised that, following this logic, equity did not permit individual ownership of land, and noted that existing titles to property were not legitimate, because most were obtained by force or cunning. Spencer wrote that contemporary land tenures not only had an indefensible origin but that it was not possible to determine the way in which land could become private property. Although squatting and subsequent cultivation of land was then commonly considered a basis for legitimate title, Spencer did not appear at that time to deem it valid. He did, however, concede to a moral rightness in a state ownership of land, with individuals leasing plots in return for a percentage of the produce from that plot. However, he also acknowledged that such socialistic or communistic ideals would

not be practicable, partly because 'a desire for property is one of the elements of our nature' (Spencer, 1850, 114-132).

In the book *On the Origin of Civilisation and the Primitive Condition of Man*, Lubbock reported on the significance attached to property and land in various communities. He noted that ownership of land did not necessarily arise with agriculture, and proposed that it had existed even in hunting communities, where ownership was often tribal rather than individual (Lubbock, 1870, 457-461). Morgan wrote that concepts of property had grown in a similar way to the development of society. He wrote of these ideas 'commencing at zero in savagery, the passion for the possession of property, as the representative of accumulated subsistence, has now become dominant over the human mind in civilized races'. He theorised that this passion for property allowed humankind to overcome the obstacles to the development of civilisation and to establish a 'political society on the basis of territory and of property'. Morgan went as far as to suggest that the mental history of humankind could be traced through the development of the idea of property (L. H. Morgan, 1877, vii, 6).

During this time, the idea of property and ownership was becoming more central in the scholarship. There were, however, differing views on individual or community ownership and whether it was necessary to be "civilised" in order to understand possession, or if hunter-gatherer communities in the past could also have had such concepts.

4.5 Conclusions

The later 19th century scholarship relating to the adoption of a sedentary lifestyle generally continued to use unilinear stage theory concepts without much consideration of the way in which the changes came about, and with authors using the same format and logic as earlier scholars had. There was still no consideration of the processes through which people became sedentary. Assumptions made by most scholars in this period that the transition to sedentism was an obvious outcome of the 'progression' of humankind contributed to building ambiguity into later scholarship, as there was no attempt to define the terms being used or the concepts behind them.

Although it is frequently asserted that the nineteenth-century anthropologists believed that evolution was unilinear, some scholars had expressed different views. Spencer, for example, stated in *Principles of Sociology* that social progress was not linear (Carneiro,

2003, 29). Spencer appears to have generally followed contemporary thinking, using the self-evident progression as an overarching rationale, but he did write of the alternative possibility that societies could changes from sedentary to nomadic, given specific limitations of the area in which they lived. He wrote at length on the conditions which caused societies to be living in the way that they were, or the way that they had been in the past. However, despite these positive aspects of his works, Spencer can also be viewed as contributing to later misconceptions, with his use of progressionism and a suite of tacit assumptions about settling down.

Anthropologists in this period added to the generally held views of the self-evident unilinear progression towards civilisation, leading on to the work of Baldwin Spencer and Gillen who, in the late 19th century, did conduct fieldwork themselves, and often became popular celebrities, with their speculations regarded, at least by the general public, as authentic fact. Their work will be discussed in Chapter 5. Nonetheless, others were still relying on third party reports from which they compiled their theories. This meant that not everything that was written as "fact" was an actual representation of the real conditions pertaining in the communities being discussed. Even those who conducted original research did so from a very Eurocentric perspective. In aggregate, however, the level of actual fieldwork in anthropology did lead to intellectual changes in the 20th century.

Chapter 5: The 20th Century to the 1950s

'multilinear evolutionism … is like unilinear evolution in dealing with developmental sequences, but is distinctive in searching for parallels of limited occurrence instead of universals' (Steward, 1955, 14-15)

5.1 Introduction

From the early to mid-20th century theorists still generally subscribed to the concept of a "self-evident" progression from savagery to civilisation. Ambiguities in theories and definitions of sedentism continued, generating the logical conundrums faced by later 20th century scholars. The statements inherent to earlier scholarship still limited fuller consideration of the issue in the early to middle 20th century. Sedentism was beginning to be considered as a topic which required some examination. Part of this can be ascribed to the accelerating focus on anthropological archaeology, particularly in the U.S.A. However, the issue was still not regarded as apparently problematic and there was no in-depth consideration of the processes or time-scales involved.

The early 20th century began with a growing awareness in the general population about archaeology and history, and many of the books were general, popular interest-style books (e.g. Brade-Birks, 1953; Vulliamy, 1925), aimed at an audience without much background knowledge of the subject matter. Scholars had begun introducing scientific approaches and methodology since the 1830s, and these have continued to be refined and applied. Archaeological investigations, too, began to be conducted more scientifically and with greater care, leading to a change in the way that conclusions were drawn about the lifestyles of the people who had occupied the sites being excavated. The key developments in this period epitomise the prevalent approach to sedentism, and also foreshadow later changes and uncertainties.

Gordon Childe is credited with the identification of the 'Neolithic Revolution' as a cultural phenomenon, and in 1925, in *The Dawn of European Civilization*, he wrote that the Neolithic 'seems interpreted as settled' (Childe, 1925, 7). In 1953, he defined the Neolithic as ' a self-sufficient food-producing economy' (Childe, 1953, 193). Part of this chapter will be structured around his work and also that of Grahame Clark and Gordon Willey as similarly important scholars of the subject. The next chapter will include later key scholars in the period from 1960.

By the end of the 1950s several presumed "material correlates of sedentism" had been identified and considered to be valid. However, much of the earlier apparent self-evidence and ambiguity remained and the material markers were not actually definitive. There was also a growing awareness of sociocultural evolution and the fact that there might not be a "one size fits all" model of human development. Some commentators realised that in dealing with cultures and communities that no longer existed, all they had to rely on was a possibly very incomplete archaeological record. By the 1950s, anthropologists such as Julian Steward and Leslie White were also contributing to the academic discourse on the subject through the debate on cultural evolution.

5.2 The 20th century to 1940

The 20th century began with frequent discussion of Spencer & Gillen's 1899 work, *The Native Tribes of Central Australia*, which outlined various facets of Indigenous Central Australian lives from the mundane to the ritual and ceremonial, and which was based on actual fieldwork, rather than second- or third-hand accounts. Kuklick highlighted the way in which some anthropologists of that time were reconsidering their methodologies and the way in which they needed to incorporate first-hand evidence of actual events. Spencer and Gillen studied communities that had very little prior contact with Europeans, and who were regarded by many Europeans as inferior forms of humankind, or as 'living fossils'. They argued that the peculiar conditions of Central Australia preserved types 'that have everywhere passed away and given place to higher forms', 'human beings that still remain on the culture level of men of the Stone Age', which they attributed partly to the fact that they had not had the advantage of developmental stimuli from contact with other societies (Kuklick, 2006, 536-542). Kuklick summed up the basic questions that Spencer and Gillen were attempting to answer as:

> 'Were Aborigines congenitally inferior?
>
> Was Aboriginal culture a degenerate form of a higher one?
>
> Did Aborigines exhibit habits that denoted a truly base behavioural standard, such as cruel treatment of women and lack of fixed ties to demarcated lands?
>
> Were Aborigines capable of generating progressive innovations independently, without the supervision of a superior race?
>
> How did Aborigines come to live in Australia and did they all belong to the same racial family?' (Kuklick, 2006, 561).

Kuklick noted that Spencer and Gillen and other discussants were following explanations which had existed since at least 1878 with Brough Smyth's treatise (Kuklick, 2006, 562). She also noted that even after the Second World War, physical anthropologists continued

to categorise Indigenous Australians as backward in evolutionary terms. For instance, in 1947, Howells, an anthropology professor at Harvard, had stated that Java Man stood 'in relation to the living aborigines of Australia as the Upper Paleolithic Europeans do to living Europeans of the present day' (Kuklick, 2006, 555).

Many anthropological archaeologists were considering issues of residence at this time. In 1923, Kroeber noted that although people in the Palaeolithic had used stone, they had not built with it, and thus knowledge of their shelters was 'almost *nil*'. He posited that some of the Upper Palaeolithic tectiform paintings could have been depicting houses, because the development of technology had been advanced enough 'to allow of the construction of some sort of rude edifices'. However, Kroeber conceded that there was no evidence, particularly of carbonised stumps or postholes, to confirm or refute this theory (Kroeber, 1923, 170).

Again in 1923 Perry posed the question of what the determining factors were which had produced different forms of culture in different places at a certain point in time. He noted that as his review, covering the area from Egypt to the Americas, was primarily concerned with people and cultures that no longer existed, the archaeological remains were the only evidence on which to base conclusions. Perry noted similarities throughout this region once humans had 'advanced' beyond the food-gathering stage, as they developed into what he termed 'archaic civilization'. However, he posited that the communities in the more distant parts such as North America and Oceania were less advanced than they had been in earlier times. Perry contended that archaic civilisation had developed in the Sixth Dynasty in Egypt and spead from there (Perry, 1923, 1-3). In a later publication, Perry theorised that all cultural developments had started from one source and spread to other communities. He wrote that the probability of two different communities independently developing cultural features such as pottery, weaving or agriculture was too unlikely, and that it could therefore be confidently assumed that it had not happened (Perry, 1924, 2).

In that 1924 publication, Perry posed two questions for scholars to answer in relation to the growth of civilisation. The first was how and why humans suddenly entered the food-producing stage after an unknown length of time as food-gatherers. The second was to explain the reasons why some communities had not made that step and what the connection was between them and the ones that became food-producers (Perry, 1924, 4-5). Perry also questioned why, in some areas, there were abrupt boundaries between food producing and food gathering cultures. These boundaries also marked the limits of cultural elements in the food producing communities such as house building, irrigation, metal-working and pottery making, and was particularly noticeable in the division

between the Pueblo Indians and the Californian Indians as well as between New Guinea and Australia (Perry, 1923, 6-7).

Discussing various groups of Pueblo Indians, Perry noted that they had been described as migrants to the area and were either 'remnants of a dwindling race or as powerful sedentary tribes reduced to distress and decadence'. He wrote that their predecessors' settlements, some of which had been constructed on an enormous scale, had been distributed over a larger area than that occupied in his time. Perry identified three main habitation types there: cave-dwellings, cliff-dwellings (in enlarged and altered caves and rock-shelters) and ruins in the valleys, plains and highlands (Perry, 1923, 15). He theorised that Palaeolithic people only began to live in caves and rock-shelters in the Mousterian period, as before that the caves had not been formed or were not suitable because the rivers had not dried up enough. He also wrote that in areas where Palaeolithic food-gatherers made stone implements, 'relative fixation of settlement seems to have been the rule' (Perry, 1924, 13, 18).

Perry emphasised that the culture of communities of the earlier food-producing people (in 'Egypt, the Aegean Archipelago, Crete, Sumer, Elam, Syria, Asia Minor, the Caucasus, Turkestan, Baluchistan, the Danube valley, the Balkans, Greece, Italy, and the middle Euphrates') were so similar that they constituted a definite cultural unity, or 'the first known civilization of the world'. He wrote that these people had sometimes had domesticated animals, made flint sickles, ground stone implements, pottery and in some cases copper implements and hard stone vases, and they lived in brick houses. Perry commented that the earliest Elamites at Susa (in the 3rd millennium BC) and the Anau community had constructed irrigation canals (Perry, 1924, 24-26). In relation to the development of civilisation, Perry noted that it was scholars' frequent misunderstanding of Darwin's evolutionary doctrines which had led to the early 20th century view that:

> 'the food-producing communities of the lower culture, that is to say, people who are generally termed "savage", represent a cultural stage through which the higher civilizations must once have passed'.

He wrote that these scholars had taken the premise that in the organic world 'the simpler forms of life have preceded those more highly organized' and extended that to posit that it must mean that simple forms of human culture must have preceded more advanced ones throughout the world (Perry, 1924, 112-113).

In 1924, after ten years of research at the Pecos pueblo in Northern New Mexico, Kidder documented its history, as understood at that time. Schwartz noted that Kidder had chosen the Pecos pueblo for his research partly because it had all the essential

components necessary to contribute substantially to the understanding of South-western prehistory (Schwartz, 2000, 12). Kidder had postulated that the early inhabitants of the area had been a small population of a 'more or less nomadic people', the Basket Makers, who lived in makeshift houses, existing mainly on small game and wild fruits and vegetables. When they first developed agriculture, initially it had little impact on their way of life. Kidder wrote that in the beginning the Basket Maker people apparently had no permanent residences and did not make pottery. However, in his view, as their cultivation of crops became more intensive and they became more dependent on them, they became more settled, used more storage and began to make pottery. Kidder theorised that at about this time communities began to turn their storage cists into houses with slab walls and pole-and-brush roofs. He posited that corn-growing permeated the Basket Maker culture in the pre-Archaic period of Mexico, with pottery and figurines coming into the post-Basket Maker communities during the developed Archaic period (Kidder, 1924, 323-328).

Kidder noted that there was an apparent break in continuity between the post-Basket Maker people and the pre-Pueblo communities, who practised head deformation, used bows and arrows and cotton, and whose housing groups became more compact. He theorised that the pre-Pueblo communities included people who came from elsewhere, bringing with them minor new cultural elements. These incomers took over many of the established traits of the inhabitants of the area such as semi-permanent houses, agriculture and pottery and developed them, becoming more settled. The question of whether the development of the succeeding Pueblo civilisation was autochthonous or whether it was influenced by external cultures was discussed by Kidder, who tended to favour the view that its development was largely independent. He also noted that (at that time) little was known of the transition from the pre-Pueblo period to the Pueblo period itself. Kidder wrote that the early Pueblo culture diffused well beyond the pre-Pueblo areas, into territory not previously occupied by sedentary people. Late in this period, the farming communities developed compact unit-type housing. At that stage villages were usually small, without defences, and Kidder postulated that some of the small towns had had to be abandoned, possibly after being overrun by nomads from the north, although he conceded that this could also have been caused by a progressive desiccation of the Southwest. Whatever the reason, the Pueblo people had abandoned outlying territories and begun to congregate in larger communities (Kidder, 1924, 330-338).

A two-volume textbook-style book entitled *Human Origins*, written by MacCurdy, was published in 1924. The second volume covered the Neolithic, the Bronze Age and the Iron Age. MacCurdy attributed the doubling of population in the Neolithic to the 'relative

security of Paleolithic cave life', suggesting that although it led to division of labour, the demands of the larger population were more than could be met by hunting, leading to animal and plant domestication, the basis for all subsequent progress. He posited that domestication itself was more important than the question of whether or not the skills had been brought by invaders from the east. MacCurdy wrote that domestication had made the organisation of society and village life possible. He also noted that caves and rock shelters were still occasionally lived in during this period, but began to be used for special purposes such as burials. MacCurdy described typical Neolithic villages, often with round pit houses made of poles and branches coated with clay. He also discussed lake dwellings at the end of the Neolithic, and noted that these had many advantages such as light, fishing, transport opportunities and ease of sewage and refuse disposal (MacCurdy, 1924, 21-22, 61-67).

The concept of property in contemporary 'simple tribes' was considered by Boas, who suggested that at that time (1928), all known tribes recognised individual ownership of personal belongings over which the individual had control, providing they did not damage their household by disposing of them. Boas posited that, other than in fully nomadic people, defined geographical areas belonged to particular tribes, and other tribes were regarded as intruders and all the resources in a tribal territory belonged to that community as a whole (Boas, 1928, 227-228).

In 1929, Elliot Smith posited that various then extinct types of humans had moved into Britain over more than half a million years, but theorised that the earliest settled communities there, at about 2,000 BC or later, came from the 'Mediterranean Race', introducing agriculture and polished stone tools. He wrote that they were followed by 'Nordic' people (Elliot Smith, 1929, 159). It was noted by Elliot Smith that many of the 'food-gathering peoples' of this time had adopted beliefs and practices such as pottery-making from 'their more civilised neighbours'. He went on to describe the behaviour of 'primitive people', theorising that they had almost no social institutions and suggesting that there were many still living 'in this original way in natural family groups such, for example, as are found among the gorillas and other anthropoid apes' (Elliot Smith, 1929, 183).

Elliot Smith proposed that 'the creation of civilisation was the most tremendous revolution in the whole course of Human History' although he assumed that the change from a simple nomadic lifestyle to the social system of city life had taken place within a few centuries. He subscribed to the prevailing view of the time that civilisation had started in Egypt, and thus theorised that a group of people in Egypt gave up nomadic life

and began to cultivate the land, leading to the construction of civilisation and the development of state systems. Elliot Smith theorised that wild barley had attracted the earliest settlers into Egypt and that barley had been the initial cultivated and irrigated crop. He noted that although the concept of irrigation began at the same time as agriculture, the first traces of civilisation were found in Egypt and Sumer, both almost rainless regions. He suggested that the granaries invented to store seeds could actually have been triggers for the development of housing, noting the Egyptians, using wattle and daub, appeared to have been the first real house-builders. Elliot Smith described the beginning of villages as a 'momentous event in Human History' as they set the conditions for civilisation and forced humans to develop social organisation. He suggested that 'true civilisation began when Man adopted a settled mode of life based upon the practice of agriculture', with the reasoning that if humans had a secure means of sustenance they could settle in a definite place, which they then made their home (Elliot Smith, 1929, 248-267, 283).

Elliot Smith did allude to the transition to sedentism not being an instantaneous and all-encompassing phenomenon, writing that:

> 'in those remote times when certain human beings first abandoned nomadic habits and began to create the system of civilisation … the earliest pioneers of civilisation would learn from neighbouring peoples, who were still living as primitive nomads …'.

However, he also wrote that the evolution of civilisation in Egypt took place within the timeframe of the 4th millennium BC. Elliot Smith discussed the Greek concept of a 'Golden Age' of simple, happy, primitive people and the concomitant implication that this meant a general degradation of humans up to the time of the Greeks, suggesting that the stories which were brought back by explorers in the 16th-18th centuries provided an impetus for scholars to consider the conditions of 'primitive life'. He also equated the practice of agriculture with the foundation of civilisation (Elliot Smith, 1929, 164-166, 180, 275).

In 1936, in a discussion of the changing understanding of the antiquity of different culture groups in the New World, Kidder wrote about the ways in which ultra-conservative views on the subject had halted archaeological consideration of the subject for forty years. He noted that the discoveries at Folsom, Clovis and other sites had proved that humans had been in the New World for at least ten thousand years, and posited that they had been there since before the beginning of the Neolithic period in the Old World. Kidder theorised that there was a long and slow degenerative transition from the Folsom cultures to the cultures which existed in North America at the time when the maize-pottery

complex moved northwards, introducing sedentary agricultural life. At that time some scholars believed that the oldest remains from Peru and Mexico dated from the current era. Kidder wrote that he believed that the Basket Maker period was short lived, stating that it was:

> 'not a true developmental stage, but rather that it represents a short phase of transition (probably before 500 AD) during which an essentially nomadic population … was assimilating, in maize, the most obviously and immediately useful trait from gradually expanding farming cultures to the south' (Kidder, 1936, 144-148).

Writing in 1938, Steward and Setzler suggested that at that time archaeology and ethnology were diverging, rather than contributing to understanding of mutual problems, and went on to consider the different ways in which the disciplines treated data and culture. They noted that archaeological monographs were often more concerned with the minutiae of ceramic analysis with much less attention being paid to subsistence and the geographical environment, even where such information was plentiful. Steward and Setzler argued that it was important to be able to understand the adaptation of an economy to its environment. Such information on the human ecology would enable inferences to be made about population density and stability and the composition of villages in an area. They noted that complete and detailed excavations, with wide-ranging interpretation, were necessary to provide data relevant to considerations of culture processes (Steward & Setzler, 1938, 4, 7-8), potentially forming the basis for more precise approaches to the issue of sedentism.

In the small portion of his 1947 work which was devoted to pre-literate societies, Van Sickle wrote that in the Neolithic in Europe, in addition to the development of weaving, 'a revolution likewise occurred in housing'. He posited that the more progressive of the Neolithic people stopped using caves and other shelters almost entirely, and instead built houses, which were usually constructed of poles and twigs coated with mud and with thatched rooves. These structures were clustered in permanent settlements, often inside defensive stockades. Van Sickle wrote that permanent settlements (as they were at that time envisaged) suggested the availability of a dependable food supply, and theorised that as agriculture developed, cultivation was left to the women, working with hand-tools, while the men hunted and fished. The domestication of animals changed this, as the women were not strong enough to handle teams of oxen drawing primitive ploughs, and so the men changed from hunters to farmers. Van Sickle posited that the later nomadic herdsmen appeared in the steppes of eastern Europe and western Asia and in the semi-desert parts of North Africa and Arabia, and the domestication of the horse had led to

continued conflict between these nomads and agriculturalists (Van Sickle, 1947, 26-27). Yet, as previously, the issue of the residential status was considered self-evident.

In *The Science of Culture*, White quoted Tylor 's contention that cultivated cereals were 'the great moving power of civilization'. White considered that the energy harnessed and controlled through agriculture and the pastoral arts had enabled a great advance in cultural development, which had led to the major civilisations of Egypt, Mesopotamia, India and China in the Old World and Mexico, Middle America and the Andean Highlands in the New World. He posited that as a result of the agricultural revolution and the augmented energy resources it provided, villages, tribes and confederacies gave way to cities, nations and empires (White, 1949, 371-372). In his consideration of the processes of cultural development, White theorised that social systems must be closely related to their underlying technological systems. He posited that nomadic hunters would use certain types of technology and have a particular type of social system, whereas sedentary people with, for example, a shellfish economy, would have a different social system, as would pastoralists or intensive agriculturalists, maritime traders or industrialists. White qualified this by saying that while there was tremendous variation in the social systems of primitive people due to their particular circumstances of habitat and technology, all known social systems which relied on human energy (pre-pastoral and pre-agricultural) belonged to a common type. More precisely, they were relatively small, with a minimum of structural differentiation or functional specialisation, with no highly developed societies and with a technology powered solely by human energy. White proposed that in the early stages of their technological development, societies of pastoralists and agriculturalists still had relatively simple, undifferentiated systems. However, he posited that a profound change in the social systems of these societies took place when agriculture had developed to a certain (unspecified) extent (White, 1949, 376-377). In this way, societies were considered to have been defined by their economies, with a predetermined pattern of change.

5.3 Diffusion of culture

Theories on the diffusion of culture have been propounded for many centuries, but they escalated with the discovery of the Americas when, as Spinden noted, the main focus of ancient history was Biblical, and writers searched for parallels with Old World cultures and events (Spinden, 1928, 45-46). Scholars in the early 20th century developed differing views on the likelihood of the diffusion of culture, and considerable debate ensued. Some of the discussion on this will be covered in the section on Childe later in this chapter.

Elliot Smith, a self-declared diffusionist, noted the two opposing views on the development of civilisation. He wrote that the majority of contemporary anthropologists subscribed to the view that any community anywhere in the world could have progressed to civilisation independently, without any outside influence. Elliot Smith questioned how under such circumstances those independently developing societies could show striking similarities to each other in their technology, customs and beliefs. He posited that all Eurasian and African civilisations had developed through some diffusion from Egypt. Elliot Smith addressed the issue of the development of civilisation in the New World and whether it was autochthonous or had been influenced in some way by people from Old World cultures. He used the similarities in architecture, particularly the pyramids, as well as in customs and beliefs, to argue that there was 'unmistakable evidence' of Asiatic origin, with the addition of some Melanesian and Polynesian features (Elliot Smith, 1928, 7, 17-20).

In the same volume, Malinowski provided counter arguments, describing 'extreme diffusionism' as 'as futile and fallacious as the belief that every culture follows an independent course of evolution'. He attributed basic human needs as the driving force behind humans' development, and the skills with which different communities addressed the challenges determining how they progressed (Malinowski, 1928, 30-35). Other non-linear views were present, but did not become prevalent at this time. In a departure from the common thread of unilinear stage theories, Vulliamy, who published a popular interest style book, *Our Prehistoric Forerunners* in 1925, proposed that there was no 'inherent law of human progress', and that the history of a race or an individual was made up of many concurrent causes and events. He wrote that different races, although descended from equally distant ancestors, had not followed the same lines of social evolution because they had had different economic and climatic conditions. Thus there were both 'wild rampageous savages who wear hardly any clothes' living contemporaneously with 'polite gentlemen in black coats, well-pressed trousers, and shining boots – elegant and thoughtful creatures of whom we may well be proud'. Vulliamy stated that it was only possible to be certain of two principal stages in humankind's history –

> 'first, men were hunters and wanderers, moving in small bands and rarely establishing a head-quarters; then, coinciding with the stage of agriculture and the domestication of animals, they settled down to the life of the encampment or the village.'

He did note, however, that although the two stages normally followed each other in 'primitive development', there were exceptions and discrepancies which could not be explained (Vulliamy, 1925, 104-105). The settling down is thus described as an unproblematic matter, related to food supply. Vulliamy also posited that social

development depended on the residential stability of a tribe and the amount of spare time available for specialisation and invention after food and shelter needs were taken care of. In line with this, he wrote that modern civilisation was not possible 'before the stage of agriculture, tranquil and continuous local residence, and the establishment of relatively large communities' (Vulliamy, 1925, 110).

5.4 The 1950s

In the 1950s, significant changes began in the knowledge of key periods and regions, especially in South-West Asia and in Europe. As an example of the way in which scholars in this period appear to have envisaged an almost instantaneous change to a settled existence, with no consideration of the processes involved, Braidwood wrote in 1952 that following at least half a million years of food gathering, humans in the Near East began a new economic stage, food production. He posited that food production implied 'an effective agriculture, including (in the Old World) animal husbandry, and a settled village type of existence'. Braidwood wrote that the food-producing settled village type of economy 'seems to have come into being with relative (even revolutionary) suddenness'. He noted that theoreticians such as Childe had emphasised the revolutionary character of its appearance before there had been any archaeological evidence of its beginnings. Braidwood also noted that the technological-economic three-part subdivision of human history (food-gathering, food-production, industrialisation) was not synonymous with the tripartite schema of Morgan (savagery, barbarism and civilisation), and posited that food-production was a prerequisite for civilisation (Braidwood, 1952, 1-5).

The Windmill Hill culture extended over much of the Lowland Zone of southern England in the Neolithic and was noted for its causewayed camps, flint mines and long barrows. In 1954, Piggott discussed the occupation of the causewayed camps, noting that they had at that time been identified as fortified village sites. However, the available evidence for accommodation was minimal, with nothing attributable to permanent buildings, and Piggott wrote that it was difficult to consider the casual hearths and scattered rubbish as remains of villages, instead being more likely to represent short and transient occupations (Piggott, 1954, 17, 26-28). Piggott also theorised, despite little evidence, that it was likely that the permanent settlements of the Windmill Hill culture, once it spread to Yorkshire, would have been in more low-lying situations in lightly wooded valleys between the chalk hills, similar to those in the south (Piggott, 1954, 113). Again, the declarations specify that substantial structures are apparently unproblematic indices of "settled" people.

In the introduction to *Theory of Culture Change* (1955), proposing his theories of multilinear evolution, Steward distanced himself from the unilinear stage theories of cultural development of the nineteenth century writers, particularly Morgan and Tylor, and contemporary writers such as Childe and White (Steward, 1955: 5). Steward discussed analogies between cultural and biological evolution and noted that complexity in biology and culture differ, quoting Kroeber (1948: 297) 'The process of cultural development is an additive and therefore accumulative one, whereas the process of organic evolution is a substitutive one.' (Steward, 1955: 12-13). Steward wrote of the importance of local particulars in dealing with taxonomic schemes. He suggested that a classification such as savagery, or a hunting and gathering stage, was too broad, and that the factors which led to a patrilineal band of a localised lineage were very different from those which produced nomadic, bilateral bands of many unrelated families or the myriad other types of hunting and gathering communities. Steward considered that some characteristics, such as the absence of dense and stable populations or of large permanent towns with craft specialisation, would be common to all hunting and gathering societies. He argued that the more important considerations were the particular ways in which cultural features differed in those societies and the processes by which they developed into farmers or herdsmen were paramount, and theorised that it was necessary to consider particular types, rather than very broad categories. Steward also commented on the striking parallels in the development of the Old and New World civilisations (Steward, 1955: 24-5).

In his discussion of the pit lodge villages of the Basket Maker III communities in the Western Pueblo area, Steward noted that although they appeared to have been more permanent than those of the Basket Maker II people, who practised very little horticulture and moved camps seasonally, there was evidence of 'slight seasonal population shifting'. He also commented that in the Basket Maker III period, farm plots had assumed greater asset value than hunting land. This change in property ownership changed the social structure with fewer, larger villages. The villages of the following Pueblo I communities had had more defined social units but otherwise were similar to those of the Basket Maker populations (Steward, 1955, 161-163). The term "village" is used as an undefined proxy for sedentism or sedentary lifestyles, but is also used to refer to the settlements of the North-West Coast Indians, who were at this time viewed as mobile or partly-sedentary hunter-gatherers.

In a paper on theories of economic development, Spiegel outlined his views on the concepts of economic stages and morphologies of economic systems, describing them in

general as ‘a relative harmless exercise in pedantry’ but noting that they became misleading when used in the more ambitious historical sequences, such as had happened in Germany in the 19th century. He wrote that contemporary economic theorists had rejected earlier theories of economic stages as not being scientifically based, which had hindered the correct understanding of ancient and medieval economies (Spiegel, 1955, 520-521). These critiques had little influence in archaeology.

In 1956, Moscati noted that climatic conditions in the Near East had changed considerably in the Mesolithic period. He wrote that there were two main innovations established by the Natufian people during this time – the beginnings of animal domestication and the harvesting of wheat and barley. Moscati posited that the main importance of these changes was that they marked the beginning of a transition to a settled life, and theorised that cultivation must have begun during the Natufian period or shortly afterwards. He also noted that scholars’ concepts of the Neolithic, with villages and later cities, were constantly changing as new discoveries were made (Moscati, 1956 , 12-13). By this he means the specifics of the information, not the assumptions about the obviousness of the change.

Between 1930 and 1936 Kathleen Kenyon excavated at Jericho. Her findings, and the publicity they generated, caused some rethinking of aspects of settled life, such as the assumptions that pottery was necessarily developed once communities had settled down. However, they also created problems, for example by assuming that there must have been permanent settlement where there was durable architecture. At the Marett Memorial Lecture in Oxford in 1956, Kenyon described her findings at Jericho and considered their implications in relation to the beginnings of civilisation and the development of settlement (Kenyon, 1956). She noted that when Jericho was being excavated in 1930-1936, ‘our picture of man’s emergence from Palaeolithic savagery through Neolithic barbarism to the civilization of the metal ages was a neat and tidy one’. In this classification, it was nomadic hunters who first developed agriculture and stock-breeding, which provided a sound enough economy to allow them to become non-progressive but self-sufficient settled villagers. After the later adoption of the use of metals and craft specialisation, villages developed into towns with the need for organised rule to control them. Kenyon pointed out that Garstang’s 1935 soundings of the lower levels at Jericho had provided evidence which challenged this paradigm, with some remains of a town-like settlement with a culture that was developed but which apparently had no pottery. The housing was rectilinear, with plastered floors and rush matting, and with outside courtyards with cooking hearths. Despite the absence of pottery, there were limestone dishes and bowls. In 1952, Kenyon’s team found, as she described them, massive “town”

walls and a tower. Kenyon placed the settlement of two separate Neolithic groups at Jericho as preceding some of the previous earliest known settlements in Western Asia (Kenyon, 1956). This determination of the settlement as having been a "town", based on the substantial structures that were found, was in line with contemporaneous concepts of markers of permanent residence and urbanism.

Beardsley and colleagues produced a more nuanced view (as noted in Chapter 2) that went some way towards a comprehensive summary of possible processes and triggers for stages in the change from what they described as 'extreme community mobility to complete sedentariness', and envisaged the transition as a process or series of processes. For each stage they identified the dynamics that produced it, the community characteristics, economic aspects, social organisation, whether there were any extant ethnographic examples, the archaeological criteria for its identification and archaeological examples and corresponding terminology in other schema (Beardsley et al., 1956, 135-146). The stages of their schema relevant to this thesis are the third to the sixth: Central-Based Wandering, Semi-Permanent Sedentary, Simple Nuclear Centered and Advanced Nuclear Centered. (Beardsley et al., 1956, 136-143).

Beardsley and colleagues also described types of community patterns in pastoral nomadic communities which used domesticated animals. They noted that from the point of view of mobility, these communities could be included in the Restricted Wandering pattern but that their socio-political and religious features closely paralleled three of the community structures based on domesticated plant foods. Their groupings were: Incipient Pastoral Nomad (impossible to detect archaeologically), Equestrian Hunting and Diversified Pastoral Nomadic (Beardsley et al., 1956, 147-149)

There was a distinction in cultural development between communities with agriculture and those with domesticated animals, according to Beardsley and colleagues. They posited that increased sedentism was correlated with increased cultural complexity as the communities moved from wild food gathering to intensive agriculture, while in the domesticated animal-using scale, cultural complexity increased even though communities retained mobility. Beardsley and colleagues noted that Diversified Pastoral Nomad communities were able to attain the essential features of the sedentary groups in their last stage. They posited that settled life had definite advantages, and that communities which progressed beyond the Restricted Wandering stage without settling down did so because of special circumstances which outweighed the difficulties of community mobility (Beardsley et al., 1956, 150).

Part of Caldwell's doctoral thesis on trend and tradition in the prehistory of the eastern United States was published in 1958. In this he posited that, even if they were available to people in the Late Archaic (at the beginning of the second millennium BC), ideas and material items such as funerary rites and pottery were not accepted or able to be developed until the population had become at least partly sedentary and had attained an economic basis which could support them. He also noted that in considering the Northern tradition of the latter half of the first millennium BC, archaeologists had been too willing to explain the construction of large mounds and earthworks as indicative of an economic surplus derived from food production on an extensive scale. Caldwell posited that there was no evidence that the Hopewell people used cultivated plants more than natural supplies, and that they had still been in a hunting-gathering stage (J. R. Caldwell, 1958, vii-viii). Yet they posed a conundrum, because they were building large structures.

In *The Evolution of Culture*, White has a chapter entitled 'The Agricultural Revolution'. In this he lists a sequence of seven developments that took place in Mesopotamia and the Nile Valley following the development of agriculture. This list makes no mention of the agriculturalists or developed societies being or becoming sedentary. Whether this comes from an assumption that the agriculturalists were already sedentary or whether White did not regard it as important enough to mention is not clear (White, 1959, 281-302). There are only two mentions of residential status in this work. The first is a comment that in some instances agriculture was initially practised by nomadic people, with seeds being sown in the spring before the community left a winter camp for summer hunting or grazing, with the crops being harvested in the autumn on the group's return. The second is in relation to the periodic division of tribes as human populations increased with the more abundant food supplied by domestication, suggesting that it was 'compatible with their mobile, if not nomadic, mode of life' (White, 1959, 287, 289). These comments by White do show that it was beginning to be realised that agriculture did not require sedentism. This, however, was not fully accepted until the 21st century.

As discussed in the introduction, the remainder of this chapter will consider part of the scholarship of some of the people who could be considered as key authors on the subject of the transition from a mobile to a sedentary way of life. It will not include all the works of these key authors, and will only deal with the published writings of scholars whose main contribution was before 1960.

5.5 Vere Gordon Childe

Childe did much to bring archaeology to the forefront of public awareness and, through his prolific writings, allow the general public to understand much more about history. He has been described as 'one of the most eminent archaeologists in the twentieth century' (e.g. Orser & Patterson, 2004, 1). Sherratt wrote in 1989 that:

> 'Gordon Childe occupies a very special place, not only as the most distinguished European prehistorian this century, but as one of the first to combine a professional mastery of the subject with a wider vision of its significance'.

Sherratt noted that Childe had used factual material to contribute to long-standing debates such as the evolutionary models of social development, the relationship between Europe and Asia and the significance of technological change. He also commented that despite the fact that much of Childe's scholarship has been superseded by later discoveries, 'many schools of archaeology still hail him as a founding father'. Sherratt concluded the article with the sentence: 'Prehistoriography is still a dialogue with the ghost of Childe' (Sherratt, 1989, 151-153, 185).

In one of his earliest publications, Childe wrote an article on the Neolithic Dimini culture in Thessaly in 1922. In this, he discussed fortification walls and architecture. Other scholars at that time had identified the rectangular huts with wattle-and-daub roofs as storage places for funerary ashes, partly because of the absence of hearths and kitchen refuse, the stone pyramids and clay pedestals associated with them, the ochre-painted walls and the arrangements of the pots inside the structures. Childe, however, wrote that he was not convinced that the structures were for cinerary urns, and suggested that they were built in the rectangular form of houses for the living found in other places which were accepted as settlements. The structures in those settlements were pit-houses with wattle and daub superstructures, often with two rooms, and which contained ovens or hearths. He did add in a footnote that some of the structures were apparently too large for ordinary houses, some being up to 18 x 12 metres. He also theorized that the Dimini people had supplemented their 'simple economy of hunting, fishing, and agriculture' with 'a partially pastoral *régime*' (Childe, 1922, 266-267, 274). Yet this allows a disjunction between durable structures and settled life which was not elaborated on.

In a chapter entitled 'The Transitional Cultures' in the first edition of *The Dawn of European Civilization*, published in 1925, Childe discussed epipalaeolithic cultures. He referred to the Maglemose culture people, who were hunter-fisher-gatherers, who lived on the shores of Ancylus lake, sometimes living on wooden platforms. He did not, however, at that time, give an indication of his views on the permanence of these dwellings or of

the occupation of them (Childe, 1925,1-3, 8). He theorised that a 'truly Neolithic culture' existed in the south of Spain at the time of the Asturians in the north, who were food-gatherers who lived in caves. He concluded the chapter with references to the epipalaeolithic cultures proving continuous occupation and development of parts of Europe from the Palaeolithic to the Neolithic, without defining whether the occupation was continuous in one place (Childe, 1925, 14-20). In the fourth edition of *The Dawn of European Civilization*, Childe noted that the sites of the Ertebolle culture revealed the debris of a sedentary population which still had a gathering economy, with some of their shell heaps measuring up to 90 x 25 metres (Childe, 1947c, 11) – a perspective taken up in the 1990s by Rowley-Conwy (Rowley-Conwy, 2011).

Again in *The Dawn of European Civilization* Childe wrote about the 'peasants' of the Danube valley and theorised that 'Erösd and Tripolye may then represent settlements of the same mobile people who created one of the cultures of Anau and that of Honan.' He also wrote that it was possible, but unlikely, that they might have been the 'neolithic brachycephals' who took agriculture and domestic animals from Asia to Europe (Childe, 1925, 159). In the Danubian I period, Childe wrote that people lived in small villages composed of irregular oval sunken huts, but noted that a clay model from Moravia demonstrated that they had been able to build apsidal houses, and that in Thuringia they had built rectangular houses. He noted that the Daunbian I culture was the earliest Neolithic 'civilization' in Central Europe and helped civilise the surrounding areas. He also noted that there was a large population increase as agriculture developed, which led communities to found new settlements in unoccupied areas on fertile loess (Childe, 1925, 171-173).

The Aryans: A Study of Indo-European Origins (1926) provided Childe with a platform to present his research on the development of the Aryan language group people. In this, Childe wrote that philology was one of the ways in which the progress of humans from animalism to savagery to barbarism and then to civilisation could be understood. He discussed the lack of agricultural terminology in the Aryan languages and theories that the Aryans were 'semi-nomadic pastoralists who only occasionally stopped to cultivate the soil by rude and primitive methods'. Childe noted that previous theories that there was a phase of nomadic pastoralism between food gathering and settled agricultural life could no longer be maintained, and that in some cases 'tillage preceded stock-raising'. Childe's position at that time was that he did not believe it was possible to tell which came first, or whether the Aryans had been mainly pastoralists or peasants. He also highlighted the fact that 'cases are not unknown in which sedentary peoples have taken to nomadism',

particularly in times of climatic crisis (Childe, 1926, 3, 83-84, 143), demonstrating Childe's flexibility of mind.

In his 1931 book on the Neolithic village of Skara Brae in Orkney, Childe did not specifically state when the village was inhabited, and indeed suggested that its occupation could have been post-Roman in date. He did, however, state that because the same culture was found in all the excavated levels, it meant that 'a single people, imbued with the same architectural traditions and possessed of the same material culture, had occupied the site continuously throughout the long period needed for the accumulation of 15 feet of midden'. Childe also theorised that the village had been self-sufficient, with its economy based on sheep and cattle, and was peaceful, leaving no evidence of weapons (Childe, 1931, 1, 6, 96-98).

In *New Light on the Most Ancient Near East*, Childe noted that ethnographers had described the lifestyle of the Nilotic tribes of the Sudan as something that might represent an intermediate stage between the food-gathering Capsian hunters and the agriculture of the earliest settled communities in Egypt. He also noted that in the 19th century the Hadendoa had been nomadic herdsmen who also maintained more or less permanent villages close to land which was inundated each year, to which they moved in late summer. He wrote that they broadcast millet seeds on the wet mud and then stayed there for the harvest (Childe, 1935b, 51).

In an address to the Prehistoric Society, Childe discussed Thomsen's Three Age system, and raised some anomalies, noting that some cultural features of the Neolithic (using his definition of food-producers) such as polished stone axes and pottery could also have been used by food-gatherers. He also noted that his definitions did not completely fix the lower limits of the Neolithic because sometimes industrial specialisation and organised trade were found in a culture which was otherwise typologically pure Neolithic (Childe, 1935a, 34-35). In further discussion of the Neolithic Revolution, Childe noted that the basic industry in nearly all the oldest food-producing settlements excavated in Europe, the Near East and North Africa had been mixed farming, with cereal cultivation and animals bred for eating. He also noted that the food-producing economy became established during a time when the climate became drier and that food production did not initially completely replace food-gathering (Childe, 1936, 85-92).

Noting that Russian archaeologists had discovered that Predmostian mammoth hunters had constructed substantial semi-subterranean houses in 'clever' locations, Childe commented that it demonstrated that they had a knowledge of the habits of the herds they

were hunting. He also cautioned against underrating the possibilities of a food-gathering economy, comparing the Aurignacians and the Magdalenians in central France with the British Columbian Kwakiutl in the 19th century, living in permanent villages with ornate wooden houses despite having a Palaeolithic economy (Childe, 1936, 65-66). This association is ambiguous, appearing to show that Childe considered these populations of complex hunter-gatherers to be permanently settled.

Positing that as communities became food-producers, rather than food-gatherers, after the beginning of the Neolithic Revolution, Childe wrote that not only would populations have been able to expand but also for the first time children would have become economically useful as they would have been able to help cultivate the land. He introduced a caveat – 'the adoption of cultivation must not be confused with the adoption of a sedentary life', and stated that the customary contrasting of the 'settled life of the cultivator with the nomadic existence of the "homeless hunter"' was quite fictitious. Childe supported this caveat by again quoting the Northwest Coast Indians, with substantial permanent villages, and the Ice Age Magdalenians, who occupied the same caves for several generations. He also noted that some cultivation methods led to a kind of nomadism when land has been cropped to exhaustion and their houses, 'flimsy hovels', can easily be replaced elsewhere (Childe, 1936, 77-81).

Childe noted that the Neolithic revolution was the end-product of a long process. However, 'it has to be presented as a single event because archaeology can only recognize the result; the several steps leading up thereto are beyond the range of direct observation'. He also noted that there would have been great diversity in the Neolithic communities, with groups of hunters and fishers, migratory horticulturalists and nomadic pastoralists, but that these were not known about as archaeologists had concentrated on the more settled communities, some of which had grown into cities. Childe noted, in relation to the area from the Nile and the Eastern Mediterranean to the Iranian plateau and the Indus Valley, that the Neolithic revolution had meant 'the populations are essentially sedentary' (Childe, 1936, 118-119). In this work, Childe posited that sedentary life led to improved housing. He wrote that the earliest Egyptian farmers had lived with simple reed wind-screens plastered with mud and the proto-Sumerians had tunnel-like houses made of bundles of reeds with mats hung on them. However, soon after, mud and beaten earth houses were being constructed in Egypt and in Asia. The invention of mud-bricks in Syria or Mesopotamia before 3,000 BC had allowed for free construction and monumental architecture (Childe, 1936, 124).

In the third edition of *The Dawn of European Civilization*, Childe noted that in the 19th century scholars had believed that Neolithic immigrants to Europe had been able to start farming in an area left empty after being abandoned by hunters of reindeer and mammoth. However, by Childe's time, archaeological remains of Mesolithic communities had been discovered, bridging the gap between the communities (Childe, 1939a, 1). Childe described animal and plant domestication as 'revolutionary steps in man's emancipation from dependence on the external environment', also allowing for the population increase which led the 'primitive half-sedentary farmers' through a second revolution to become 'a settled peasantry producing surplus foodstuffs' which fed those who had become part of an urban population. He also noted that the 20 plus metres of debris from prehistoric villages beneath the large cities in Mesopotamia demonstrated that there had been an 'immense antiquity' of settled life there (Childe, 1939a. 14).

In an article published in 1939, Childe noted that in the Danubian I period, millennia before the Central European Bronze Age, whereas in the Orient, Crete and Thessaly there were small townships permanently occupied by experienced farmers with craft specialists and traders, 'beyond the Balkans nomadism reigns'. He also noted that the farmers were spreading out, moving the hamlets of around 20 households to new, virgin fields every few years. In the same article, Childe discussed the Central European Bronze Age. In addition to the discussion of cities in Egypt and the Near East, he noted that contemporary with them there were fortified townships in Anatolia and peninsular Greece. At the same time the Balkans and the Hungarian plain had townships which were mainly occupied by farmers. Childe noted that their rural economy was developed enough to support a 'truly sedentary population', but suggested that their trade may not have been well enough organised to allow the population to be completely stable. He wrote that the same would have applied in Bohemia and southern Germany (Childe, 1939b, 21). His observation of the non-correspondence between mobility, durable structures, sedentism and agriculture did not appear to affect his habitual models.

In *What Happened in History*, first published in 1942, Childe describes 'the escape from the impasse of savagery' as an economic and scientific revolution in which people became 'active partners with nature instead of parasites on nature' after the Ice Age, although he posits that this was not achieved by the most advanced Palaeolithic savages (the Magdalenians) but by less specialised and 'less clever' groups from further south. The sowing of seeds and cultivation of the land was, according to Childe, the first step in the Neolithic revolution and was what distinguished barbarism from savagery (Childe, 1942, 43). Childe wrote that the Neolithic villages in Europe and the Near East were usually small, often between 0.6 and 2.6 hectares. Skara Brae, in the Orkneys, had only

eight households, and in Central Europe and Southern Russia they averaged 25-35 homes. He wrote that Neolithic communities were potentially, rather than actually, self-sufficient and were seldom strictly sedentary (Childe, 1942, 53-55). The earliest Neolithic settlements excavated in the Eastern Mediterranean area showed evidence of a mixed economy, and Childe noted that the first village at the base of the Sialk tell, for example, had been built by hunters who bred cattle, sheep and goats and grew cereals using irrigation and who spun and wove and made decorated pottery and stone vessels. At Fayum, west of the Nile, grain silos were not large enough to support the community on cereals alone, and would have only supplemented a game diet. At the 2.5 hectare site of Merimde, the huts were arranged in regular rows along streets. North of the Alps, the oldest Neolithic settlements showed that grain-growing and stock-breeding were the dominant economic activities. Childe noted that the Western Europeans had cultivated cereals, flax and apples, but their main food staple was cattle. He also noted that although these people were pastoralists, they were not nomadic, building wooden pile houses on the Swiss lake shores and stockaded encampments on the South English downs and the hills overlooking the Rhine (Childe, 1942, 47-50). The pastoral-sedentary debate continued.

Edge ground tools were described by Childe as ‘the essence of the neolithic tool’, although he cautioned that ground stone celts were not an infallible sign of the Neolithic in terms of self-sufficient food production (Childe, 1936, 101-102). However, in 1942 he noted that polished stone axes were ‘not quite unknown to savages and not invariably employed by barbarians whose economy is or was neolithic’ (Childe, 1942, 45). Here he recognised that materiality need not correspond to sociality. But the observations went no further. Similarly, he described pottery-making as a universal feature of Neolithic communities, except for the Natufians. He acknowledged that pottery could have been discovered before agriculture, but wrote that it was only made in large quantities in the Neolithic. The first signs of a textile industry, spindle whorls, were found in the earliest Neolithic villages (Childe, 1936, 106). Again in 1942, he wrote that Neolithic equipment was much more abundant than that of the Palaeolithic or Mesolithic savages. There he posited that barbarism developed through an aggregation of scientific discoveries and inventions (Childe, 1942, 45).

The houses in Neolithic villages that had been excavated by the mid-1930s in Egypt and western Europe were arranged in regular formations. Childe posited that the Neolithic economy and Neolithic villages, despite their small size, would not have been able to exist without cooperative communal efforts and social organisation (Childe, 1936, 109). He also wrote that new concepts of construction of pottery and fabrics and other materials

were also applied to housing, with huts of mud, reeds, logs, stone or clay-plastered branches (Childe, 1942, 45). Childe described technological achievements in the Stone Age, and quoted White saying that Neolithic farmers had 'harnessed powerful forces of Nature' and made 'biochemical mechanism work for him', using tools which became standardised. He noted that the use of these technological resources varied between societies, and thus could not be used to subdivide the Neolithic. He wrote that, theoretically, the Neolithic should have started with a mixed economy, as it had in the earliest Near Eastern Neolithic settlements. However, the Danubian I and the Lower Neolithic of Western Switzerland 'notoriously reveal just the opposite' (Childe, 1947a, 49-50).

Also in 1947, Childe, arguing for the usefulness of archaeology, noted 'if archaeological data are to be really serviceable in the social sciences, they must be presented classified on a new and less superficial basis'. He wrote that the stage theories of savagery, barbarism and civilisation summarised by Morgan, Engels and others would need to be reconsidered in consultation with anthropologists and historians (Childe, 1947b, 90). In a later article, Childe noted that wherever the sequence of savagery, barbarism and civilisation was complete, as defined in economic terms using Morgan's criteria, they always followed in that order. He wrote:

> 'In other words, everywhere and without exception, the oldest discernible human groups lived as parasites on nature by collecting, hunting, or fishing. In many regions this food-gathering economy was eventually replaced by a food-producing economy based on the cultivation of edible plants, the breeding of animals for food, or a combination of both. Still later, a few farming societies began to produce enough food to support a varied population of artisans, merchants, priest, and officials, and at the same time to use writing.'

In this context, Childe also wrote that although the evidence was too scant to be conclusive, there was almost as much archaeological evidence for chiefs, war and the subordination of women among savages as among barbarians (Childe, 1949, 103).

Again describing the hierarchy of three evolutionary stages, Childe stated that they could be 'proved archaeologically to follow one another in the same order wherever they occur'. He noted that savagery and barbarism could be recognised and defined by their food procurement methods – savages living exclusively on wild food obtained by collecting, hunting or fishing and barbarians at least supplementing the natural resources by cultivating edible plants and (in the Old World north of the Tropics) by breeding animals for food. Childe wrote that civilisation could not be defined as simply, proposing that the use of writing had been a characteristic of some of the communities. He noted that it has

been only occasionally, such as with the northwest coast Indians, that hunter-gatherers had constructed small settlements, whereas Neolithic farmers lived in permanent villages. However, he theorised that unless the villages had irrigation for their crops they had to move at least every twenty years. Childe reported that the largest Neolithic village known at that time was Barkaer, in Jutland, comprised of 52 one-roomed dwellings. However, he noted that 16-30 houses were more usual, so the average community would have been 200-400 people (Childe, 1950b, 107-109).

Prehistoric Migrations in Europe was published in 1950. In this, Childe wrote that the Palaeolithic Gravettians had lived in caves where they were available, but were noted for their 'open stations', which contained 'quite substantial dwellings' which were semi-subterranean and roofed with skins supported by slanting poles. He wrote that at the end of the Ice Age, hunters had moved into the treeless tundra in northern Europe, and camped in summer and autumn on sandy ridges (Childe, 1950a, 18-23). Childe noted that the Mesolithic Maglemoseans 'were of course no longer nomadic, but, despite the development of collecting and fishing and the wealth of natural resources, they had not yet achieved an economy so sedentary that they could dispense with seasonal migrations.' He also noted, however, that there was some recent indirect evidence (the use of geometric microliths in Britain, Denmark and Sweden) that some groups had developed a richer culture and been more permanently settled. Childe reported that the Maglemose in North-Eastern Europe had adjusted to the Boreal environment and adopted an 'increasingly sedentary mode of life based on collecting and fishing'. He theorised that there was an independent invention of pottery in the north, and that the coastal population were sedentary and thus could use fragile vessels (Childe, 1950a, 31-34). Childe's use of terminology in this publication was somewhat ambiguous, and lacked definition of his meaning for the different residential statuses.

In 1953, in a chapter on the Neolithic in *Anthropology Today*, Childe defined it as 'a self-sufficient food-producing economy'. He divided the Neolithic into both vertical divisions and horizontal divisions, noting that Neolithic agriculturalists would have supplemented their diet with hunted, fished and gathered food. Childe theorised that in the European temperate forest zone, shifting agriculture could be inferred because it seemed that settlements had been only briefly or intermittently occupied (Childe, 1953, 193-199).

In the sixth edition of *The Dawn of European Civilization*, published in 1957, Childe reported that although there was evidence of Palaeolithic food-gatherers in peninsular Greece, there was still no evidence of Mesolithic inhabitants there. The archaeological record, as then known, began with 'mature Neolithic cultures'. In Thessaly and Central

Greece, the villagers had lived in small round or rectangular wattle and daub huts or mud-brick ones with stone foundations. Childe noted that the development of small tells indicated that the inhabitants had a rural economy which had been developed enough to maintain soil fertility (Childe, 1957, 59-60).

One of Childe's last books was *The Prehistory of European Society*, published posthumously in 1958. In this Childe once again confirmed his acceptance of Morgan's determination of food production marking the boundary between savagery and barbarism and the beginning of the Neolithic. He wrote that in Europe 'this new productive economy still seems to appear fully-fledged', with cereals introduced from southwest Asia, and with its farmers living in villages in large, well-constructed houses, using edge-ground tools and pottery and they spun and wove. Here, Childe appears to accept material indices whose definitive nature he had questioned. He posited that the population had increased at a similar rate to that which happened in the Industrial Revolution in England. He did note that 'the prelude to the Neolithic Revolution must have been much longer, and it is less easy to decide what precisely should be termed its culmination' (Childe, 1958, 33-34). Discussing the differences in initial agriculture in Europe and the Near East, Childe posited that immigrants must have taken emmer, barley, sheep and goats from the Near East to Europe, together with appropriate husbandry skills. He noted that in areas in the Near East where there was not enough rainfall, shifting cultivation methods meant that whole communities had to become more mobile to seek fresh land. Childe also commented that in more arid parts of the Near East the dry cultivation sedentary villages must have practised some system of alternating between pasture and tillage, and that by 3,000 BC they had used oxen with ploughs to cultivate fields. Even in the Early Neolithic, settled village communities in the Near East had received luxury articles from traders (Childe, 1958, 38-41).

Wheeler pointed out in the Foreword to the Revised 1963 edition of *Social Evolution*, again published posthumously, that evidence that had been accumulated since 1951 had rendered redundant Childe's criteria of pottery-making as a prerequisite for the food-producing stage, or barbarism, of human development (Wheeler, 1963, 5-6). In *Social Evolution*, Childe had discussed Morgan's three stages of civilisation and compared them to Thomsen's Three Age system and the Soviet reclassification into pre-clan society, clan or gentile society and class society and noted that the Russian scheme 'assumes in advance precisely what archaeological facts have to prove' (Childe, 1963, 28-39). Continuing his previous comments on the Danubian I culture cycle, Childe wrote that large areas were colonised to accommodate expanding families and poor economic practices. Once all the available land within walking distance of a village had been

exhausted, the whole settlement would have moved to a new area. After the old villages had returned to woodland, the area might again be incorporated into the cycle. Childe noted that the farming villages had up to twenty long houses. Their gabled halls had walls of split saplings with wattle and clay and varied from 5.5 to 6.7 metres wide to 9.15 to 39.6 metres long, with an average length of 21.36 metres. He calculated that although some would have been used as stables and granaries, a village would have had between 200 and 600 inhabitants. Childe also speculated on whether there had been a separate 'Western Neolithic' cycle, originating in North Africa, and colonising parts of Spain, Portugal, France, Switzerland and the British Isles (Childe, 1958, 49-53).

In 1960, Braidwood and Howe credited Childe with a large part of the renewed intellectual interest in 'the transition to the established village-farming community' and its significance as 'a major landmark in human history'. They commented, however, that there was the danger 'that Childe has overstressed the realm of technology in his treatment of the character of the transition and of the way of life of the early village-farming communities', particularly in relation to his oasis-propinquity hypothesis. They continued by asking how scholars could interpret 'the moral order' of an extinct culture from only its material traces (Braidwood & Howe, 1960, 7).

A conference was held at the Institute of Archaeology, London, in 1992 to commemorate the centenary of Childe's birth and to discuss the continuing significance of his work. At this conference, Flannery noted that the Neolithic Revolution in the Andes region had been a much more complex process than Childe had envisaged, with three main pathways to Neolithic life there. Some foragers, for example, had remained semi-nomadic for thousands of years after the beginnings of plant domestication. Flannery also noted that some early Peruvian settlements undermined Childe's 'oasis-propinquity hypothesis', occurring in a coastal area with 4mm of annual rainfall (Flannery, 1994, 103). Harris noted in his introduction to the volume of Conference papers that Ruth Tringham had pointed out a decade before that more recent data had outgrown Childe's syntheses and that his interpretational models had, by then, been either refuted or regarded as untestable (D. R. Harris, 1994, 2). Despite Childe's models of the Neolithic being challenged, they nevertheless gave great impetus to the study of the period and to consideration of the transition to sedentism, and incorporated assumptions which persist even though he had noted the non-correspondence of materials and sociality.

5.6 Grahame Clark

Clark was notable for his different approach compared with earlier scholars. For example, he posited that the introduction of a farming economy did not immediately result in the development of settled life as understood by modern people, and that it was the cultivation of crops, rather than livestock, that first led to a sedentary existence (J. G. D. Clark, 1940). Clark also proposed that it would be wrong to argue that the adoption of ceramics was made necessary either by a settled lifestyle or by the practice of agriculture (J. G. D. Clark, 1952). In 1996 Bonsall wrote that Clark's definition of the Mesolithic, as the period 'between the close of the Pleistocene and the arrival of the Neolithic way of life', was still widely accepted (Bonsall, 1996, 1). He still, of course, retained the association of agriculture and settled life.

Clark's early academic career was focussed on the Mesolithic, and his first major publication was *The Mesolithic Age in Britain*, in which he wrote 'there is no reason for regarding the Mesolithic as a necessary stage in the evolution from the food-gathering to the food-producing stages of civilisation'. Instead, he posited that the people of the Mesolithic were the remnants of a more primitive civilisation (J. G. D. Clark, 1932, 12). Clark wrote that the oldest human-made dwellings that had been discovered in Britain by 1940 had been circular summer shelters constructed from birch and ling by Mesolithic food-gatherers (J. G. D. Clark, 1940, 29). He had noted in 1937 that scholars' knowledge of the houses of the later Windmill Hill (Neolithic A) community was scant. However, he theorised that those people had had normal houses, barns and granaries, and that they would not have been noticeably inferior to contemporary buildings in Swabia or the Rhineland (J. G. D. Clark, 1937, 469), that is, that substantial buildings were an index of sedentism. In 1939, Clark referred to summer settlements of the Maglemose people and contrasted them with settled communities on tells in south-eastern Europe and the Near East 'inhabited through centuries and even millennia, often with little break'. He noted that it was only at the end of the Bronze Age, 'when settled farming took root in our part of the world' that hunting became economically, if not yet socially, inferior (J. G. D. Clark, 1939, 84, 103, 154).

Yet, importantly, in 1940 Clark also posited that:

> 'the introduction of a farming economy did not for some time result in the development of settled life as we understand it. Our Neolithic forbears and those of the earlier stages of the Bronze Age were essentially pastoral nomads who supplemented their food-supply by cultivating corn-plots and by hunting, fishing

and the collection of wild plant produce. Settled farming based mainly on husbandry came in with the plough'.

He theorised that it was probable that what had been termed 'camps' of the Neolithic people of southern England such as Windmill Hill and Avebury had actually been the headquarters of what were 'predominantly pastoral tribes', and that what had often been interpreted as pit dwellings had in fact been storage pits (J. G. D. Clark, 1940, 24-25).

Prehistoric England (1940) included many references to residential systems. Clark wrote that semi-nomadic pastoralism and the use of garden plots had led to increases in Middle Bronze Age populations. During this period, social groups were still small and society patriarchal, but seasonal gatherings were held at places such as Avebury, Stonehenge and Arbor Low. He also wrote that in the Early Iron Age communities appeared to have lived in individual farms or small hamlets made up of aggregations of those farms, with the inhabitants having more opportunity for specialised activities such as making ceramics and iron smithing. He noted that settled agriculture had made larger communities practicable, and allowed political development and economic progress. The flint miners of the Beaker culture constructed oval houses, dug 15-45 cm into the ground, which were wattle-walled and transitional between pit-dwellings and farmhouses (J. G. D. Clark, 1940, 26-29). This is a long time into and beyond the "Neolithic", indicating that while Clark recognised conventional indices of sedentism he also clearly perceived that other patterns of behaviour and material had existed.

From Savagery to Civilization was published in 1946. In this, Clark sets down a progression of stages through which humans had passed, starting with savagery (which he divided into lower savagery and higher savagery), then primitive barbarism (which became modified as it spread) and finally civilisation. He theorised that the northward movement of the northern hemisphere temperate zone at the end of the Pleistocene could have led hunter-gatherer groups to domesticate plants and animals instead of themselves migrating, 'the momentous step which marked the transition from savagery to barbarism'. It was posited by Clark that primitive barbarian societies were more settled than savage societies, suggesting it was the difference between settled agriculturalists and roving food-gatherers which had led some Victorian scholars to propose an intermediate stage of pastoral nomadism (J. G. D. Clark, 1946, 25, 72). The varied, intermediate designations of some or complete sedentism are mixed with definitive indices and the long tradition of pastoralism and nomadism not quite fitting in to the "stages".

Clark wrote in 1952 that there were three main stages in the economic history of Europe. These were savagery (exclusively plant-gathering, hunting, fishing and fowling), then

barbarism, which had a more integrated economy with farming added to the previous categories and, finally, urban civilisation. There were finer divisions within these stages, but Clark nominated the two chief turning points as the spread of farming and of the urban civilisation which was based on it. Clark wrote that the fabric of civilised existence in cities depended on the cultivation of olives, figs and grapes, 'which in itself involved fixity of settlement'. However, he also commented that it was incorrect to assume that the introduction of agriculture had meant the ending of hunting and gathering, because yields were not great enough and there was abundant game in the forests. He noted that Thessaly had been sufficiently settled from the beginning of Neolithic settlement for mud-brick villages to be occupied permanently (J. G. D. Clark, 1952,15, 21, 48, 138).

Discussing the Natufian culture in 1961, Clark noted that they had harvested cereals and that it was highly suggestive that the Natufians had been the earliest settlers to form real urban communities (J. G. D. Clark, 1961a, 40). However, in a contemporaneous publication he also noted that the Natufians 'almost certainly moved seasonally' in order to effectively exploit the animal and vegetal resources in their territories, with some settlements being longer term base camps (J. G. D. Clark, 1961b, 49). The ambiguity continues.

Clark theorised that the process of transformation to agriculture was Mesolithic rather than Neolithic, with gradual rather than catastrophic-scale changes, and with domesticated species in a minority for a long time. It was only after a long period of experimentation, when some species had emerged as sufficiently productive to provide the main sources of food that the risk could be taken of settling down and concentrating on cultivation. He wrote that agriculture was by no means the only basis for becoming sedentary, and noted 'it was the cultivation of crops rather than livestock that first called for settled life'. (J. G. D. Clark, 1961b, 43, 62). Clark also posited that the adoption of a sedentary lifestyle 'by no means precluded the exploitation of more extensive territories by segments of the population' (J. G. D. Clark, 1989, 285).

Writing in 1989, in *Economic Prehistory: Papers on Archaeology*, Clark discussed what Childe had first termed the Neolithic revolution. He wrote that it depended on one's point of view as to whether it should be considered as a revolution. In that publication, Clark noted that it was only communities that had been stable for a sufficient length of time that featured in the archaeological record (J. G. D. Clark, 1989, 291, 325). Clark displayed a remarkable ability to perceive varieties of economic behaviour and decouple material markers from sedentism. But he also retained the ambiguities of "settled" life and referred to material indices of sedentism.

5.7 Gordon Willey

Willey and Ford's survey of prehistoric settlement patterns in the Viru Valley, Peru (Willey, 1953b, and others), was at the time regarded as one of the first comprehensive studies of its kind. At the time, Willey noted:

> 'the term "settlement patterns" is defined here as the way in which man disposed himself over the landscape on which he lived. It refers to dwellings, to their arrangement, and to the nature and disposition of other buildings pertaining to community life. … Because settlement patterns are, to a large extent, directly shaped by widely held cultural needs, they offer a strategic starting point for the functional interpretation of archaeological cultures.' (Willey, 1953b, 1)

In 1953, in discussion of the causes of urbanism, Willey noted that, to date, there had been a lack of adequate settlement study in Middle America, particularly in the lowlands (Willey, 1953a, 382). Discussing assemblages in the Midwestern Taxonomic System, Willey wrote that, if the historical unity of the assemblage could be assumed and if the data are sufficient, site interpretations (such as hunting community or sedentary village agriculturalists) are feasible. Functional interpretation is possible because of the available cultural and natural contextual backgrounds. Willey wrote that one context is provided by the site ecology while another comes from ethnological and modern analogies to the artefacts and architectural features (Willey, 1953a, 364).

Willey made an important point about assumptions of the ways in which sites had been occupied. He discussed Ford's theories of seriation, time-change and continuity in American archaeology and the tendency of archaeologists to make certain ceramic types conform to an expected unimodal curve. Willey posited that refuse deposition in a particular location might not reveal a continuous history of site occupation or artefact usage. The occupation, desertion and reoccupation of an area could lead to a confusing frequency graph, which Willey wrote was sometimes 'smoothed' by researchers to conform with what was expected. He suggested that this, together with misinterpretation of the functions of artefacts, could lead to incorrect conclusions on site occupation (Willey, 1953a, 365-366). As with Clark, in Willey's work the beginning of an effort to analyse the operational characteristics of culture rather than just define them is apparent.

Yet in some instances Willey also appears to equate pottery and agriculture with sedentism. He used the term 'sedentary pottery-makers' in discussion of the development of human culture in Arizona and New Mexico in the first millennium AD (Willey, 1953a,

369). In discussion of the possibilities of the diffusion of cultural traits from the Old World to the New World, Willey theorised that cultural traits consisting of myths or features of primitive social organization are not essential parts of a 'sedentary agriculture-based civilization', and do not necessarily identify the introduction of foreign ideas which produced such a culture (Willey, 1953a, 371). He wrote that recent concepts of a New World Formative cultural level are based on the spread of a functionally related complex: 'maize horticulture, a sedentary way of life, developed craft specialization, including ceramics, and fundamental socio-religious beliefs tied up with an agricultural economy' (Willey, 1953a, 375). Willey also wrote of the way in which the mound-plaza complex was assumed to correlate with intensive agriculture in the eastern United States (Willey, 1953a, 381). Willey posited that archaeology had destroyed the hypothesis that the pre-European contact Plains Indians had been nomadic, with a simple culture. It had shown that the earlier inhabitants of the region had been sedentary, and practised intensive horticulture (Willey, 1953a, 372).

In their 1958 book *Method and Theory in American Archaeology*, Willey and Phillips do not refer to residential status when discussing Steward's six developmental stages. They also do not consider it in discussion of Krieger's similar developmental scheme for North America, despite both schemes covering the time period of the development of agriculture. They go on to elucidate their categorisation of two broad divisions in New World culture-history of a fundamental technological and economic basis – hunter-gatherers and agriculturalists – which they compare with the Old World divisions between the Palaeolithic-Mesolithic stages and the Neolithic and later stages (Willey & Phillips, 1958, 66-72).

Willey and Phillips divided North American cultures into five main culture groups: Lithic, Archaic, Formative, Classic and Postclassic (Willey & Phillips, 1958, 75). They wrote that they had come to the conclusion that the presence of agriculture by itself was not of primary significance from an abstract, developmental point of view, and it only became of significance when it was the dominant economic base that was 'integrated socially to produce the stable settlement patterns of the Formative stage'. They noted that certain cultures that they had previously classified as Archaic because they had no agriculture had, in fact, achieved stable settlement patterns and other prerequisites of the Formative stage without agriculture (Willey & Phillips, 1958, 107-108). "Stable" retains the ambiguity of expression of the preceding European scholarship, since a mobile society that continuously uses a landscape can be as "stable" a system as settled communities are.

Willey and Phillips described stone vessels as particularly characteristic of the Archaic period. They wrote that the presence of stone vessels 'reflects the greater stability of occupation postulated for some of the later cultures of this stage', suggesting that there are obvious reasons why migratory people do not like stone vessels. They referred to artefacts, including ceramics, being found in village-site refuse despite the descriptor 'preceramic' being used for the Archaic period. Willey and Phillips continued their description of the Archaic, writing that habitations 'do not appear to have been any more permanent than in the Lithic, though, possibly, greater use was made of caves and rock shelters' in which there were accumulations of refuse from intermittent occupations which might suggest an illusory degree of stability and continuity. The architecture was not durable enough to leave traces and there were no storage pits or other evidence of settled existence. They suggested that the depth of deposits could imply a sedentary or at least seasonal type of occupation, dependent on specialised subsistence economies, which was quite different from the nomadic way of life that had previously been assumed for the Lithic stage (Willey & Phillips, 1958, 108-111).

In 1955, Willey and Phillips defined the Formative period 'by the presence of maize and/or manioc agriculture and by the successful socieconomic integration of such an agriculture into well-established sedentary village life' (Willey & Phillips, 1955, 765). In 1958 they refined their definitions to include the Preformative stage, with the emergence of agriculture prior to its successful integration into a well-established sedentary village lifestyle. They theorised that settlement patterns, not agriculture, are the main criteria for classification into stages. They allowed for evidence of stable sedentary organisation without an agricultural basis, either because there was no evidence of agriculture or because the environment was unsuited to it (Willey & Phillips, 1958, 145). The classification presumes that the material form of settlement correlates to "degrees" of sedentism, but the demonstration is not provided and pastoral nomads who build permanent, durable settlements are ignored (see Cribb, 1991, for examples of mobile pastoral communties living seasonally in permanent settlements of durable buildings).

In a paper to the 1960 Conference *Courses Toward Urban Life*, Willey noted that the early hunters, before 7,000 BC, in Mesoamerica were nomadic. These hunters of large grassland game, around the end of the last glaciation, had similar lifestyles to those obtaining in both South and North America at that time. Willey wrote that in the incipient cultivation phases from 5,000 to 3,000 BC in Sierra Madre and Sierra de Tamaulipas, sites were larger than in the preceding period but were likely to have been occupied only seasonally. He noted that in a later phase, from 2,200 to 1,800 BC, two Almagre sites 'suggest greater stability of residence than anything previously seen in the sequence'. In

his conclusion he wrote that between 7,000 to 1,500 BC in the Mesoamerican uplands there had been a steady increase in domestication and utilisation of food plants, with a concomitant trend towards larger and more permanent settlements and the earliest Mesoamerican semi-permanent architecture of wattle and daub houses (Willey, 1962, 87-89, 99).

In discussion of the Village Agricultural Threshold (Early Preclassic Period) in this paper, Willey noted that it had not been determined where in Mesoamerica village agriculture originated. Willey took the position that there was no sudden agricultural revolution but several millennia of incipient cultivation. He defined village agriculture as 'sedentary community life based primarily upon plant cultivation'. There were both concentrated and dispersed village settlements, but Willey stated that the important thing was that the locus of the village was stable. He wrote that certain early phases in the early Preclassic period are characterised by sedentary village sites with artificial ceremonial mounds. Willey posited that the change from simple sedentary communities to communities of villages-and-centre had been an important turning point in the cultural and social history of Mesoamerica, taking place in the middle and late Preclassic periods – the beginning of the change from simple to complex societies (Willey, 1962, 92-94, 100).

The overall point is not to argue that these suites of changes did not happen, but that the material-economic-social correlates of sedentism are taken for granted – as self-evident – and ambiguous and varied terms used to refer to permanently settling down, degrees of sedentism, etc. obscured the discussion of the nature and operations of sedentism and sedentariness.

5.8 Conclusions

Consideration of settled living developed during the period from 1920 to 1960, particularly through the works of archaeologists such as Gordon Childe, Grahame Clark and Gordon Willey and anthropologists such as Julian Steward and Leslie White. These scholars developed more in-depth studies of the archaeological record to include more than just buildings and artefacts. Concepts of multilinear, rather than unilinear, evolution developed, which was the beginning of a basis for resolving the sedentism debate by escaping from models of linear paths to urbanism.

Although the question of the processes through which communities became settled was generally still not considered in depth, nor thought of as really problematic, some scholars

began thinking more seriously about the residential status of communities and how those communities actually operated. Great credit is to be given to Grahame Clark for his meticulous observations. There was still a considerable acceptance of the self-evident assumptions laid down in the Enlightenment period. Despite consideration of issues such as the identification of some of the material correlates of sedentism and ways of recognising it in the archaeological record, there was still no attempt at serious definition of the terminology being used, and so the ambiguities continued to build.

There was clear evidence in this period of the start of a change in scholars' awareness of the need for careful consideration of the archaeological record. The Braidwoods, for example, had ended a 1953 essay on the then available primary archaeological evidence for the appearance of the earliest village communities in South-Western Asia with a single sentence: 'The time is probably past when the prehistorian may hide his ignorance behind speculations of movements by mysterious "peoples from the north" ' (Braidwood & Braidwood, 1953, 310).

In 1924, Perry had raised questions about the determining factors behind different cultural forms through time and place and questioned how and why some communities had become food producers and why others had not. During this period in the early to mid-20th century, these sorts of issues had begun to be examined. It was starting to become apparent that there was no certainty about the types of indices, such as the use of pottery, which would indicate a sedentary community. However, despite this increasing awareness, the use of such indices remained prevalent.

The following chapters will look at how the issues were re-examined in the later part of the 20th century up to the present day. They will show how the self-evidence starts to be questioned, but the ambiguities have begun to build up because there was still no attempt to consistently define the concepts.

Chapter 6: The 20th century from the 1960s to the 1990s

'Preoccupation with the search for "the origins of agriculture" has diverted attention from the broader question of "how mobile "hunter-gatherer" bands gave way, as a dominant mode of human organization, to permanently settled, complex communities'
(D. R. Harris, 1977b, 402)

6.1 Introduction

In the three decades from 1960 to 1990 there were significant changes in the way the subject of sedentism was approached. However, although there were alterations in thinking and redefinition of some of the issues, there was still ambiguity and lack of clarity. Much of the scholarship was dominated by considerations of the initial development of agriculture. In this period there was considerable research into hunter-gatherers and their ways of living, and the 1960 and 1970s redefinition of the hunter-gatherer lifestyle as "affluent" created new questions about the transitions to sedentism and why they may have happened. This redefinition showed that progress as a model did not work, because it highlighted the good quality of life in hunter-gatherer communities, as opposed to the previous assumptions that their quality of life had been miserable and poor. There was an apparent bias towards the study of communities labelled as complex hunter-gatherers, considered to be "more" sedentary than other hunter-gatherers, rather than of communities which had recently become fully settled. Nevertheless, the study of a wide spectrum of types of settlement systems did bring the subject of sedentism into the overall archaeological discussion of the time, with scholars re-engaging with the issue.

During this period, there were attempts to define what constituted sedentism and a sedentary lifestyle, without consensus being reached and without any resolution of the ambiguities. There were still many entrenched assumptions but some of these assumptions began to be questioned. Despite the ambiguity and lack of clarity, some scholars wrote as if the fundamental issues had in fact been clarified. By contrast, the periods in which sedentism may have developed were intently studied worldwide, predominantly in the context of the study of domestication and settlement patterns. Systematic research was not conducted on the issue of the duration of residence that would be defined as sedentary or that should be considered as an operational characteristic of sedentism. The change from the accepted way of thinking was exemplified by the work of scholars such as Kent Flannery and David Harris, among others. Much of this chapter will be structured around examples of the work of the key thinkers on the subject in this period.

In 1972, Flannery highlighted some of the ambiguities which still plagued the current situation by suggesting that Western scholars had confused the interpretation of three variables, namely agriculture, sedentary life and villages, and theorised that they were not necessarily interdependent. Flannery also recognised that there was no "one size fits all" model, and that there had been different trajectories to village societies in different parts of the world. He commented, 'such convergence on a common state through different pathways implies something about the adaptive value of the village as a settlement type' (Flannery, 1972, 23-27). In 1977, David Harris suggested that scholars' interest in the change from foraging to food production had hampered consideration of the more general process of cultural change from mobile bands to permanently settled communities (D. R. Harris, 1977b, 402). He later noted that although philosophical speculation about domestication and the beginning of agriculture reached back to Classical times, more specific research on its origins only had a history of a little over a century (D. R. Harris, 1989, 11).

In 1980, Binford published *Willow Smoke and Dogs Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation*, which is one of the most quoted archaeological papers (730 citations listed on *Web of Science* citation index as at 30 September 2015) and often used in studies of residential status. This research was, however, based on ethnographically documented hunter-gatherers who had already had contact with sedentary societies and who were not, therefore, pristine examples of communities moving to a sedentary lifestyle without outside influence.

6.2 The 1960s

In a paper delivered at the 1960 Conference on Courses Toward Urban Life, Haury spoke of the settling down in the greater American southwest. He suggested that the southwest needed to be considered differently from the New World as a whole, where 'the settling down process was a correlate of maize tillage' except for some maritime groups. Haury postulated that in the Cochise sites (some pre-maize, some from the first and second millennia BC) of the southwest, vast accumulations of grinding stones and the considerable accumulation of refuse, together with subsurface storage pits, 'strongly hint at localized and perhaps near-continuous residence'. He wrote that the Cochise people could have been engaged in deliberate cultivation of species such as *chenopods* and *amaranths* as early as 4,000 BC. This would have predisposed the people to the acceptance of maize culture. Haury noted that the architectural detail of houses and their

arrangement and number in a community during the time of incipient maize cultivation were not known, but they were likely to have been semi-subterranean pit houses with dirt-covered beam and brush superstructures and entry through the sides. He reiterated that much of the greater southwest had some experience in settled living before the arrival of maize and other seed crops, and that formalised communities did not arise for another two thousand years. After those 2,000 years, village life began, together with 'other concomitants signalling full sedentary living'. Haury posited that Braidwood's 'village-farming communities' were distinct from the earlier long-occupied camps of the Cochise Culture and cited the Bluff Site, with house pits dug into solid sandstone, as evidence that the villages were not temporary camps (Haury, 1962, 115-118).

In 1962 Daniel noted that in both the Old World and the New World, peasant village communities came into being from the dual bases of cultivation and animal domestication. He also wrote that nomad societies in Arabia, North Africa and Central Asia developed from the single base of animal domestication (Daniel, 1962, 164).

In his 1965 discussion of the formation of walled towns in the Diyala plains in Mesopotamia, Adams wrote that the earliest known agricultural occupation of the region was around 4,000 BC. He noted that by then, agriculture had been a mode of subsistence elsewhere since at least 8,000 BC. Adams also theorised that agriculture was an indispensable precondition for the widespread, permanent settlement of the Diyala Plains. He wrote that population growth and increasing sedentism were linked consequences of the predictable harvests and food storage that came with agriculture, and led to the growth and merging of the original nucleated villages. Adams suggested that the transition from food-gathering to food production was 'one of a handful of crucial transformations that set off the whole human career' (R. M. Adams, 1965, 33-34). In discussion of the settlements, population density and agricultural settlements of parts of the Diyala region in the Early Dynastic Period, Adams noted that probably less than one-third of the available land and water were under irrigation agriculture. This would have meant, particularly in the northern part of the lower Diyala basin, that population density must have remained low, and the people were 'non-sedentary by modern standards'. Adams described the Diyala plains, with large unoccupied areas with excellent grazing and access to streams as the ecological niche which semi-nomadic tribesmen would have moved into from the Fertile Crescent or the foothills of the Zagros mountains (R. M. Adams, 1965, 42).

In 1966, Meighan described the Mesolithic as the period when settled villages were developed along the shores of oceans, lakes and streams with a hunting and gathering

economy, utilising smaller land animals and shellfish and marine resources as well as the possible development of the use of plant foods. He wrote that Mesolithic cultures began controlling food resources through the domestication of animals and plants. This transition to food production marked the beginning of the Neolithic period, or the Neolithic revolution. Meighan noted that this change was not abrupt, with domestication of plants and animals taking a minimum of two or three thousand years both in the Old World (starting about 8,000-7,000 BC) and in the New World (starting about two thousand years later). He also noted that the change to food production left very little evidence in the archaeological record as the change was so gradual. Meighan wrote that as communities stopped being mobile and became sedentary, they started to accumulate large amounts of refuse, and the archaeological remains of towns and cities reflect their level of technological development and social organisation (Meighan, 1966, 74-79).

Caldwell and Gyles, in the 3rd edition (1966) of their work *The Ancient World*, devoted just under a page to discussion of 'Transition to Settled Life', most of which consisted of a discussion of clan systems. They theorised that once a person became a member of a clan, and thus a member of a larger tribe, they were entitled to use the common property of the group, which changed from the hunting and fishing grounds to grazing and arable land. Caldwell and Gyles also posited that there had been some property, such as tools, clothing, ornaments and some land which had had personal ownership. They discussed 'Early Village Economies', theorising that in Mesopotamia in 7,000 BC (and later in Egypt and the Indus region) transhumance was practised until the people settled permanently on the fertile land in c. 5,000 BC (W. E. Caldwell & Gyles, 1966 , 21-23).

In *An Introduction to Prehistoric Archaeology*, Hole and Heizer have a chapter on Patterns of Settlement. This chapter has only passing references to hunting and gathering people, and no discussion of changes on the path to a sedentary lifestyle**.** There is a section on dwelling types, which has a table of the relationship between the economy and site sizes from Mesolithic to Bronze Age sites, but again no discussion of the changes (Hole & Heizer, 1969, 305-327, 297-301).

6.3 New Views on Village Life in the Near East - Robert Braidwood

In 1953, Robert Braidwood and his wife Linda discussed the earliest village communities in southwestern Asia, suggesting that the newly-discovered technology of radiocarbon dating was starting to provide evidence that the 'nuclear' Near Eastern ones (with evidence of the earliest development of food production) were the earliest in the region, if

not the world. They noted that it had only been in the previous two decades that there had been any significant investigation of prehistoric strata in sites in the Near East, and that, to that time, there was still little comprehensive prehistoric material. The Braidwoods divided the era of the transition from food-gathering to food-producing into three stages, from the terminal era of the food-gathering stage, the era of incipient agriculture and animal domestication and the era of village-farming efficiency, which they described as 'more provocative, in ordering our own thinking about the available materials, than the much-used Grecisms "Mesolithic" and "Neolithic".' They stated that their working definition for the beginning of the era of village-farming efficiency would be the establishment of permanent village sites, with assemblages relating to a basic farming economy and with one or more levels of stable architecture (Braidwood & Braidwood, 1953, 278-279, 288, 310).

Describing excavations in the Plain of Antioch, Braidwood suggested in 1960 that farming and a settled community life were cultural prerequisites for the domestication of animals. He noted that Charles Reed had theorised that animal domestication first occurred in the Iran/Iraq area, based on the presence of wild goats, sheep, cattle, pigs, horses, asses and dogs and the fact that settled agricultural communities had already been established in that region (Braidwood, 1960, 146). In *Prehistoric Men* Braidwood wrote that microliths had come into use in the Near East by at least 10,000 BC, and there was then a gradual build-up towards what was in his view 'the first *basic change* in human life', the domestication of plants and animals and the production of food rather than the gathering or collecting of it, which he described as being as important as the Industrial Revolution. He wrote that people settled down 'with a degree of permanence' in village-farming communities once their food-producing strategies became reasonably effective (Braidwood, 1967, 88). Braidwood theorised that before about 40,000 years ago, people had 'gathered' their food, using simple hunting techniques and scavenging over a wide area. After that time, there was an intensification of the economy, with people 'collecting' their food in a more restricted area, and 'settling in' to a greater degree, with the rate of intensification increasing after the last Ice Age. He described people in Western Europe in the period leading up to this as living in rock-shelters and cave entrances and, in Eastern Europe, building very crude semi-subterranean huts and with open encampment sites. However, Braidwood did question whether sites with such basic shelter had actually been occupied all year-round (Braidwood, 1967, 74, 87).

Seasonal camps, particularly the Maglemosian summer camps and the winter-early spring encampment at Star Carr, were of particular interest to Braidwood. He described the people who occupied the Maglemosian settlements as having, at 6,000 BC, made some

quite successful adaptations to living in a post-glacial forest environment, while suggesting that they were 'still just as much simple hunters, fishers and food collectors as they had been in 25,000 BC' (Braidwood, 1967, 84-87).

By the 7th (1967) edition, Braidwood had not his changed statements from the earlier editions of *Prehistoric Men*, in which he had written that the 'how' and the 'why' of the great food-producing revolution were not known, while noting that the consequences of effective domestication of animals and plants could be seen in the spread of settled farming-village communities which contained 'the seed of civilization'. Importantly, he wrote 'the question of year-round and year-in, year-out permanence is at issue' (Braidwood, 1967, 87-88) – as it has remained. Braidwood raised the question of why effective food production happened first in the Near East then, slightly later, happened independently in the New World and in the Far East, and why it happened at all. He theorised that it was not simply a response to environmental changes, and noted that the earliest sites of village farmers had similar climatic conditions to that obtaining in those areas in current times (although a later addendum stated that new evidence of a relatively treeless steppe condition along the Zagros flanks until after 9,000 BC might necessitate further reconsideration of this position) (Braidwood, 1967, 89-91, 111). In 1960 he had written:

> 'In my opinion there is no need to complicate the story with extraneous "causes". The food-producing revolution seems to have occurred as the culmination of the ever increasing cultural differentiation and specialization of human communities.' (Braidwood, 1960, 134).

Braidwood considered that there was a tendency for people to begin to settle down in the food-collecting era, and the settling down intensified at the end of that period. He suggested that by then, although caves were still being inhabited, there were traces of more permanent life in outdoor camp sites (Braidwood, 1967, 64). Braidwood also wrote that he believed that incipient cultivation and animal domestication represented the first era of the food-producing stage. The second era covered the primary village-farming communities when village sites began to appear, with concomitant increases in human population and in the number of sites. At this stage the earliest village-farming community sites show traces of new crafts. Braidwood defined a region where there was a variety of wild plants and animals which could both be domesticated and were ready for domestication as a central or core or nuclear area. He suggested that it would not be feasible for food production to start outside such nuclear areas, although in some nuclear areas, such as parts of Africa, food production never started (Braidwood, 1967, 93-94).

In describing the populations of both the Natufian and Karim Shahir sites as having 'a tendency to settle down out in the open', Braidwood noted that their settlements had stone foundations, indicating that it had been worth their while to have built structures, even if the sites were short-lived. He suggested that there were indications of food-producing, but that they had not reached the stage of primary village-farming communities. But, he noted, it is not possible to determine whether they were living all year round in their simple settlements, but available evidence pointed towards seasonal occupation, indicating that he did not at that time consider that durable buildings were indicative of permanent sedentism (Braidwood, 1967, 108).

Braidwood remarked that he had changed his agreement with Childe's theory that village sites in southwestern Asia would necessarily contain primary evidence of food production and that permanent year-round settlement without effective food production would be highly unlikely. He cited Perrot's questioning of this concept in the eastern Mediterranean littoral. Perrot had theorised that there were early permanent villages in this region without food production, and had suggested that this applied to the Natufian open sites and some later Palestinian sites. Braidwood, however, noted that the excavators of Bouqras and Mureybat, sites which have architectural features suggesting permanency, found either none or only limited evidence of primary food production in the 7th millennium BC (Braidwood, 1967, 109). Despite Perrot's cautions, Braidwood wrote that his inclination was to consider architectural permanence (particularly rectilinear architecture) as the sign of a proper village, presumably meaning "sedentary". However, he noted that the site of Sarab, in Iran, only had traces of reed huts despite having pottery, clay figurines, stone bowls and bracelets and sheep, goats and wheat. Braidwood wrote that despite earlier assumptions that Sarab had seasonal settlement, the evidence for restricted seasonal settlement was not clear (Braidwood, 1967, 120). In 1960, he had cited Jarmo, in Iraq, being classified as a permanent, year-round settlement with about two dozen mud brick houses dating to 7,000-6,500 BC, with about 150 residents (using a similar population density to that obtaining in 1960). The houses had been repaired and rebuilt several times, with about 12 occupation levels. There were two types of domesticated wheat and two-row barley, together with domesticated goats, dogs and possibly sheep and evidence of hunted wild animals and collected snails, acorns and pistachios (Braidwood, 1960, 136-143).

Braidwood wrote that simple structures for at least temporary shelter had been constructed for some time before food production was well established. However, he noted that:

> ‘The critical issue regarding “villages” is doubtless a matter of all-season year-in-year-out permanence. The ethnological record suggests that in certain very specialized situations, intensified food-collection may indeed assure permanent settlement. Was such ever the case in southwest Asia, and on the basis of which food elements?’ (Braidwood, 1967, 110).

This ‘doubtless’ is the critical indicator that the matter does not seem to be an issue despite all the evidence of differing combinations of durable structures, agriculture, sedentism and pastoralism to which he had referred.

Braidwood cited Harlan’s crucial agronomic experiment (Harlan, 1967, 197-198) in which it was estimated that an experienced prehistoric family could probably have gathered about a ton of clean grain equivalent of wild einkorn wheat in the Cayonou region in three weeks, which would be more than they required for a year. He finished by writing that there was still a great deal more to be learnt before the issue could be clarified (Braidwood, 1967, 110).

Views on the “progression” of human life following the adoption of food production were outlined by Braidwood, who suggested that villages would have grown in size, people would have had more food, and the population would have increased. Hunting and fishing would have only supplemented what was already adequate food production. Pottery and textile production would begin, with concomitant craft specialisation and trade. Village chiefs would have had to settle disputes. Eventually religious buildings would have been constructed, and by 4,000 BC plough agriculture had developed in the villages of the Mesopotamian alluvial plain (Braidwood, 1967, 113-114). In 1960, following a linear causal chain model, he had written that as people learnt to produce food and then store it, they were ‘compelled as well as enabled to settle in larger communities’ (Braidwood, 1960, 148) – as an apparently inevitable and largely unanalysed phenomenon.

6.4 Lewis Binford

Much of Binford’s scholarship was concerned with hunter-gatherer communities, both in the past and in the present. The issue of residential mobility and stability was his particular interest. His seminal paper *Willow Smoke and Dogs’ Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation* (Binford, 1980, 82), based on ethnographically documented hunter-gatherer systems, is still the most quoted of his works. In 2002, in the foreword to *Beyond Foraging and Collecting*, Binford and

Johnson discussed Binford's work on the forager-collector continuum and his 1980s population-packing model for studying evolutionary change within archaeological sequences. Binford noted he had only begun seriously considering the relationship between logistical strategies and sedentism in forager-collector communities when Eder wrote in 1984 of his experiences with the Batek in the Philippines – an ethnographic study which further demonstrates how the role of anthropological fieldwork is changing opinions. Binford had originally focused on mobile peoples, and had thus not spelt out an evolutionary argument about the concept of collecting (sedentary communities) replacing foraging (mobile communities) in some instances. (Binford & Johnson, 2002, ix).

In 1966, Binford and his wife Sally set out their argument for what they termed 'The Predatory Revolution'. In this paper they wrote that their theorising followed Braidwood's use of the term 'level' rather than 'stage' in relation to the continuum of basic subsistence activities from food-collecting groups to village farming communities. They re-examined data from the late Mousterian period in the Near East, suggesting that the subsistence level before the final Mousterian required redefining. They defined predation as 'a way of life based on such systematic exploitation of a single species', not found in the archaeological record predating the terminal Mousterian of the Near East. Skhul Cave in the southern part of Mount Carmel had an extremely large number of *Bos* bones, and Binford & Binford referred to this as a new subsistence level they termed 'incipient predation'. Their next level was that of the 'early village-predation communities', such as the Tomsk and Kostenki herd mammal hunters, with villages of semi-subterranean houses with estimated populations of 100-200. This was followed by the 'settled village-predation' level, such as Hacilar and Catal-Höyük with permanent houses of mud and stone. They classified these levels as 'surprisingly complex' and 'anomalous in the established sequence within the food producing revolution' (Binford & Binford, 1966, 508-510).

In 1968, in discussion of theories of the origins of food production in the post-Pleistocene period, Binford wrote:

> 'If we seek understanding of the origins of agriculture or of the "spread of the village-farming community", we must analyze these cultural means as adaptive adjustments in the variety of ecosystems within which human groups were participants'.

He wrote that it was necessary to isolate the variables which initiated directional change in the internal structure of ecological systems, and in particular the conditions which favoured the rearrangement of energy-matter components and the way in which they alter the effective environment of a particular unit (Binford, 1968, 323). Notably, in 1968

Binford proposed that the question which should be being asked by scholars was why agriculture and food-storage techniques were developed at all, rather than why they were developed everywhere (Binford, 1968, 327). This question has, of course, been pursued by David Harris and many others.

Also in 1968, Binford wrote that he favoured Childe's position on changes in the physical environment leading to new structural relationships between plants, animals and men over Braidwood's nuclear zone theory. Binford, however, cited demographic, rather than Childe's gross environmental, variables as the cause of the generation of the pressures which favoured new ecological niches. He pointed out that the authors of recent demographic studies had argued against the availability of food directly controlling population density. Binford wrote that cultural practices which regulated fertility would have kept population numbers in hunter-gatherer communities below the level at which diminishing returns from the local habitat would have had an effect (Binford, 1968, 325-326). Binford allowed for what he termed 'changes which might be called regressive' in groups which moved from more complex economies to simpler ones in response to population pressures and diminishing food resources. He cited Steward and Faron's research in the non-riverine tropical forest zones in South America, where the Siriono and Guayaki Indians retreated to inaccessible regions, largely abandoning horticulture and adopting a predominantly hunting and gathering lifestyle under such circumstances. Binford put forward Lathrap's 1968 thesis that possibly all of the less sedentary South American groups were 'the degraded descendants of peoples who at one time maintained an advanced form of Tropical Forest Culture' (Binford, 1968, 331).

In relation to discussion of adaptations in population in frontier regions with rapid evolutionary changes, Binford referred to 'the degree to which settlements are characterized by sedentism'. He theorised that the frontier zones would be between regions where the resident groups had big differences in their degree of sedentism. Reduced mobility would reduce the advantages of cultural means of controlling population growth, and therefore increased population growth could be expected with increased sedentism. This would lead to a concomitant increase in emigration to maintain optimal size and density limits in the local groups. Binford posited that in a restricted geographical region with two sociocultural units with a difference in their degree of sedentism, there would be areas of tension when emigrants from the more sedentary group disrupted the density balance of the less sedentary group. He theorised that it was in contexts such as this that initial cultivation practices occurred. He also wrote that archaeological remains from both the terminal Palaeolithic and Mesolithic of the Old World and the Archaic of the New World indicated a higher degree of sedentism had been

found in areas where the population had depended on fish, mollusc and migratory fowl. Binford noted that in the terminal Palaeolithic-Mesolithic and in the Archaic there was evidence of strong population growth and the development of food-storage associated with increased sedentism. The food storage was functionally linked to the seasonality of the migratory fish and fowl used as food crops (Binford, 1968, 332-333).

Again in 1968, Binford acknowledged that the traits generally associated with the traditional view of the Neolithic Revolution including the manufacture of ceramics and textiles, relatively permanent houses, craft specialisation and a move to food production were not necessarily mutually dependent. In support of this view, he cited ceramic production in coastal Japan ca. 7,000 BC which had no grain agriculture, and the contemporaneous development of grain agriculture in the Near East with no ceramics. Binford theorised that insofar as those traits are functionally linked to sedentism and/or food production they would be expected to appear in many different regions as a result of independent but parallel inventions (Binford, 1968: 333). Though Binford worked predominantly on mobile hunting and gathering communities, which is noticeable in his research is a focus on the operations of a culture rather than a definition of the culture by indices.

The question posed by Braidwood & Willey of why incipient food production had not started earlier was considered by Binford. His 1968 response covered the conditions occurring at the end of the Pleistocene, with a change to the exploitation of highly seasonal resources (such as migratory fowl and anadromous fish), probably linked to changes in sea level worldwide. There was an associated increase in sedentism, and differences in population growth, which produced changed conditions which favoured improved subsistence technology. Binford's model predicted that the selective situations favouring incipient cultivation would be found in 'tension zones', where the less sedentary communities were being invaded by groups from more sedentary populations, when greater production is most advantageous (Binford, 1968, 334). The semi-arid areas where maize was developed in the New World and wheat and barley in the Old World were close to areas with sedentary villages that depended to a large extent on aquatic resources. The seeds of xerophytic plants found there can stay viable for longer, and there is less biodiversity. Binford noted that one of these areas is near the Jordan Valley, where the Natufian settlements had architecture which 'suggests a sedentary way of life' (Binford, 1968, 334-335).

Answering critics' suggestions that the propositions and model relating to sedentism in his 1968 work were too limited, Binford wrote in 1976 that, while acknowledging there were weaknesses, they were not what the critics had highlighted, writing:

> 'The weak points as we viewed them were not knowing in any concrete way either (1) the determinants of sedentism or (2) the demographic effects that sedentism might prompt'

He noted that they had used the study of the Nunamiut Eskimos to obtain some knowledge of the second of these, using the ethnographic study of a community that had recently made the transition from a fully mobile hunter-gatherer economy to a sedentary hunting one (Binford & Chasko, 1976, 67). Curiously and noticeable, attributes of sedentism did not seem to be considered an issue. Yet they are.

In 1976, Binford and Chasko discussed population changes concomitant with a move to food production and the then accepted assumption that this led to greater reliability in food supplies, a decrease in death rates and rapid population growth. They noted that some scholars at that time were beginning to theorise that population growth should be regarded as an independent variable in considerations of cultural change, rather than the Malthusian position that population growth is dependent on food availability. Binford and Chasko theorised that:

> 'sedentism associated with male-intensive labor will be marked by rapid and explosive population growth, whereas that associated with female-intensive labor will produce slow and gradual population growth with long-term rates of culture change'.

In some cases sedentism appeared to occur when there were economic resources with a storage potential, and that there could be major differences in the levels of sedentism and populations changes within a region (Binford & Chasko, 1976, 63-65, 139).

In 'Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation', based on his experiences with Nunamiut hunters, Binford discussed various ethnographically documented hunter-gatherer settlement systems and the factors that led to variability in the archaeological record of different sites. In this paper (and in other publications) he considered the environmental conditions which affect food availability from the perspective of the human population. Binford quoted Murdock's 1967 rating of 168 examples of hunter-gatherer communities and their degree of residential mobility. Murdock had found that the higher the effective temperature, the more mobile the population was likely to be, and that there was much less mobility in cold conditions with lower productivity. In his view, this pattern demonstrated that conditions other than food abundance affected mobility in hunter-gatherer populations.

Binford suggested that mobility, as a positioning strategy, might be 'most responsive to structural properties of the environment, that is to say the particulars of food distribution that are not directly correlated with the more intuitively appreciated conditions of food abundance' (Binford, 1980, 13-14). The core issue is how to proceed from insightful analyses of mobility to consistent operational studies of the transition to sedentism.

Discussing Binford's differentiation between residential and logistical mobility and foragers and collectors, Kelly posited that the main difference between foragers and collectors is the relationship between the location of the 'consumers' and the tasks of the individual foragers, rather than the frequency or distance moved. He also pointed out that Binford's 1980 'Willow Smoke and Dogs' Tails' paper has often been misinterpreted as drawing strict behavioural distinctions between 'foragers' and 'collectors', whereas Binford had merely used the typologies as conceptual tools in order to better understand the role mobility played in the creation of archaeological sites (Kelly, 1992, 44-45). This can be seen as the beginnings of critical analysis of the factors involved, compared with the way in which Braidwood had effectively reported archaeological findings and interpreted them using a linear, progressionist model.

Editing a volume of the *Journal of Anthropological Archaeology* dedicated to Binford's contribution to archaeological theory and practice in 2015, Schmader and Yu summed up his influence:

> 'we marvelled that the contributions of our mentor Lewis Binford had become so embedded within the teaching of archaeological method, theory, and application that students across the globe banter in dozens of languages about curation and expediency, middle range theory, processualism, Mininum Number of Individuals, logistical collecting and residential foraging, and so forth.' (Schmader & Yu, 2015, 1)

6.5 The 1970s

In the preface to the 5th edition (1970) of *The Neolithic Revolution*, a British Museum publication first issued in 1959 to accompany a series of exhibits on the evolutionary history of humankind, Ball noted that it had been necessary to print new editions of the book every two years since its original publication in order to remain up to date with the flow of new findings (Ball, 1970, v). The 1970 edition noted that the Neolithic was not a delineated period of time, but varied in duration in different regions. In this edition, Cole suggested that in the foothills of the Zagros mountains 'there were settled villages long

before cultivation or domestication took place' and before the advent of pottery. She also theorised that there could have been a stage of nomadic occupation, practising 'proto-husbandry' (Cole, 1970, viii).

In an overview of the changes in community patterns in the Tehuacan Valley, MacNeish covered the changes in community living patterns from nomadic microbands in c. 9,600 BC through to primitive city states, c. 1,520 AD. In this he noted that the processes and factors involved in the change from semi-permanent hamlet communities to nuclear village communities were very complex, and therefore difficult to understand. MacNeish theorised that in the Tehuacan Valley the main causal factors were population increases and the development of a ceremonial complex, rather than economic or subsistence factors. He likened the social changes involved to those pertaining in the Near East in the Neolithic pre-Uruk period (MacNeish, 1972, 88-91).

Higgs and Jarman proposed in 1972 that in many areas in the New World there had been significant cultural continuity between hunter-gatherer settlements and those thought to have had domesticated species. In this article, they noted that the development of agriculture was at that time being studied in a fragmentary manner through different geographical regions, without enough consideration being given to the mechanisms of change of the underlying causes (Higgs & Jarman, 1972, 11-12). Their advocacy of an operational analysis of the development of agriculture was followed up in archaeology.

In 1975, Moseley reported on his research which demonstrated that an agricultural economy was not essential to support the foundations of civilisation. He used a case study of Prehispanic civilisation in coastal Peru, with interconnected economic, demographic, the social and political models based on archaeological materials for the 800 km of coastal desert from the Chicama Valley to the Ica Valley. Mosely used the term 'civilisation' in that context to relate to 'a subsistence economy with a sufficiently high caloric output to support a dense, sedentary population which resided in settlements ranging from a few to several thousand households'. He noted that such a civilisation had not been extant at 3,000 BC but was fully present by 1,000 BC, and had developed out of a maritime economy (Moseley, 1975, 1-4). However, no demonstration that the communities were sedentary was provided. Durable buildings may have been a sufficient indicator for Moseley, but they are not elsewhere in the world.

In *World Prehistory: A Brief Introduction*, Fagan noted that changed toolkits at the time of the beginnings of agriculture had enabled more substantial and longer-lasting dwellings to be constructed. These new toolkits were not necessarily portable, and included ground-

edged and polished axes as well as hoes and grindstones. He wrote that cereal crops enabled farmers to store food for longer periods, and during this time people began altering the environment for the first time, felling trees and burning vegetation to provide areas for planting. Fagan posited that the change from hunting and gathering to herding and cultivation was a gradual process, starting c. 9,000 BC in Southwest Asia (Fagan, 1978, 123-128).

6.6 Kent Flannery

Critical reappraisals were also a key feature of Flannery's scholarship. Importantly, Flannery wrote that Western scholars had confused three variables which were not necessarily interdependent:

> 'agriculture (which does not require either sedentary life or villages); sedentary life (which does not necessarily require agriculture, and may not take the form of a village); and villages (which need not require agriculture, nor require year-round sedentary life).' (Flannery, 1972, 24)

This presumed that sedentism was and could be directly and obviously identified in the archaeological record. Flannery had recognised decoupling the issues, but it is apparently in his 1972 paper that he saw features such as rectilinearity as characteristically diagnostic of sedentism. In this paper, Flannery concentrated on the early permanent settlements which arose in the Near East and Mesoamerica, rather than the many other kinds of villages from around the world. Flannery theorised that the Near Eastern and Mesoamerican cultures had different trajectories on their path to village society, leading him to comment that 'such convergence on a common state through different pathways implies something about the adaptive value of the village as a settlement type.' (Flannery, 1972, 24).

In 1968, Flannery and Coe wrote of the transition from semi-sedentary food collecting and primitive cultivation to the beginnings of early state formation which took place between 1,500 and 800 BC in Mesoamerica. They wrote that at the beginning of that period 'a social type previously unrecorded for North America came into being: the sedentary village farming community'. In this paper they considered why communities on the Guatemalan coast had more stable, sedentary villages than in other parts of the region, positing they had been able to utilise the lagoon and estuary system to supplement their maize crops (Flannery & Coe, 1968, 267-269).

In a paper from a research seminar held in 1968, Flannery summarised his and Frank Hole's subdivision of the prehistory of Western Iran into three main stages of farming adaptation. The first, until 10,000-8,000 BC, was a period of semi-nomadic hunting and gathering, the second from then until c. 5,500 BC was a period of early dry-farming and caprine domestication with permanent villages, and the third, to about 3,000 BC, included further domesticated cultivars and domesticated cattle, pigs and dogs. This third stage featured irrigation and, in the lowlands at least, walled towns. These stages related to the adaptation to agriculture, and not to the level of social and political development. Flannery theorised that the currently-held Western view of early cultivation in the Near East having brought about a great change or improvement in human diet was erroneous, as was the view that early agriculture provided a more stable food supply, and that the erratic rainfall in the early dry-farming stage required a considerable reliance on local wild products. He suggested that the initial caprine domestication represented a means of storing unpredictable surpluses. This was changed by the beginning of irrigation, which also aggravated the environmental destruction that had occurred, to the extent that it would have been nearly impossible to return to a reliance on a wild resource economy (Flannery, 1969: 74-75).

To address the issue of why cultures change their mode of subsistence, and drawing on ethnographic data to postulate population pressure as a possible factor, Flannery cited Binford's theories on prehistoric hunting populations remaining stable at a density below the level of exhaustion of resources and adaptations taking place when this equilibrium was disturbed. He posited that a change in demography, which increased local populations to a level too close to the carrying capacity of an area, was the more theoretically likely scenario for the Near East because it did not rely on climate change (Flannery, 1969: 75-76). Harlan and Zohary's study on the possibilities of harvesting wild grains today, and their caution that agriculture may have developed in areas which were adjacent to the regions of the greatest abundance of wild cereals, rather than actually in those areas, was also considered. Flannery wrote that 'such a harvest would almost necessitate some degree of sedentism – after all, where could they go with an estimated metric ton of clean wheat?' Perrot had written that the Natufian people had been semi-sedentary, based on intensive wild cereal collection, and Flannery noted that further evidence of this came from Tell Mureybet, in Syria, dating to c. 8,000 BC, where there were clay-walled houses, grinding stones and roasting pits and the cereals might all have been wild. Flannery theorised here that 'such data indicate that sedentary life based on wild cereal collecting and hunting may be possible, and that consequently pressures for domestication may not be as strong in the heart of the wild cereal habitat as elsewhere.' He also wrote, following Binford, that it is possible that cultivation started in an attempt

to produce stands of cereals around the margins of the optimum zone which were as dense as those in the heart of the optimum zone. Binford had theorised that this might have occurred in response to population pressure from the expansion of sedentary food-collectors from the heart of the wild cereal zone into the marginal habitats (Flannery, 1969, 80-81).

In 'The origins of the village as a settlement type in Mesoamerica and the Near East: A comparative study' (1972), Flannery reported that archaeological discoveries over the previous ten years had changed the multilinear evolutionary views of the Neolithic Revolution from the concept that agriculture had freed humans to settle in villages to 'perfect pottery making, loom weaving and all the hallmarks of sedentary life'. In the Near East, settlements of purportedly fully sedentary communities with no domestic animals or phenotypically domestic cereals had been found dating to c. 8,000 BC, and in Mesoamerica there was evidence of nomadic groups who were cultivating four or five species of plants by 5,000 BC and who remained nomadic for the next 3,500 years. Flannery noted that it was being realised that agriculture and village development might have begun in different parts of the world for very different reasons and through different processes, and that one model might not explain them all. He wrote that aggregates of pre-village people in Near Eastern hunter-gatherer base camps had fluctuated and camp sizes had varied with the availability of resources, rather than with residence rules. Thus concepts of descent and territoriality were not strong, and labour was divided by gender rather than by families. Flannery noted that MacNeish had identified two pre-village settlement types in the Mesoamerican arid highlands – macroband camps occupied by 15-20 people for most of a season, and microband camps occupied by 2-5 people for a period of one or two days or up to most of a season. As both men's and women's tools were found in both camp types, MacNeish had attributed them as family collecting groups. Flannery reported that the Near Eastern base camps appeared 'larger and more nearly permanent than anything yet found in highland Mesoamerica'. The two factors which later characterised villages – family residential units and male/female work groups – had not been found in the same configurations in the food-gathering era (Flannery, 1972, 23-26).

In the final stages of the Palaeolithic in the Near East there is evidence of a trend to permanent facilities – storage pits, wells, dams, canals and fish weirs, which increased in the Natufian period. Flannery noted that the Early Formative period villages in Mesoamerica had bell-shaped storage pits and irrigation wells. Irrigation canals appeared in the Near East by at least the Samarran period and in Mesoamerica by the Middle Formative period. However, permanent facilities developed before cultivation in the Near

East and 3,000 years after cultivation started in Mesoamerica, possibly because of the differences in yields of maize and wild wheat and barley (Flannery, 1972, 26-27).

Flannery took up the issue of territoriality and states, writing:

> 'tentatively, I suggest that the origins of "sedentary life" had more to do with the installation and maintenance of permanent facilities and the establishment and maintenance of hereditary ownership of limited areas of high resource potential than it did with agriculture *per se*.'

He continued, writing that if cereal grasses had become the focus of subsistence strategy in the Near East it would have increased the need for permanent storage and processing facilities (Flannery, 1972, 28). Nomadic communities today, of course, use permanent features such as wells (e.g. Fernandez-Giminez, 2000, 1322).

6.7 Barbara Bender

Much of Bender's writing in the 1970s and 1980s was concerned with hunter-gatherer complexity and the transition to agriculture, and the concomitant implications relating to the adoption of a sedentary lifestyle. She published a general book, *Farming in Prehistory: from hunter-gatherer to food-producer* in 1975, in which she questioned why farming had developed so late in human history, positing that it was necessary to understand the background to hunter-gatherers in order to understand the beginning of food-producing communities. Bender noted that the transition was not instantaneous, but a gradual process, and that it was 'often difficult and rather artificial to differentiate between hunter-gatherers and food-producers' as there was overlap in behaviours. By the early Post-Pleistocene, hunter-gatherers in many areas of the world had had a detailed understanding of their local environments and appropriate technology with which to exploit them (Bender, 1975, 1-3).

In considering the development of sedentary societies, Bender wrote that in optimal environments, when the carrying capacity was high, 'permanent or semi-permanent settlement was sometimes possible' for hunter-gathering communities. This was particularly so when there were storable resources such as seeds and nuts, which would also have helped keep the population in the area. She noted that food production then extended the possibility of permanent settlement. There had been sedentary hunter-gatherers in South-West Asia and the cultivation of plants and transfer of high-yielding winter-grains had increased the area in which sedentism was viable. There could have been seasonal movements either from the home base or with part of the community

moving to seasonal camps. Bender noted that other areas, such as the Mexican highlands, lacked the concentrated resources necessary for hunter-gatherer groups to settle until they had undergone millennia of cultivating high-yielding resources. The wide birth-spacing necessary for a nomadic lifestyle was noted, together with the reduction in infant mortality with agriculture and sedentism (Bender, 1975, 7-8). Bender did note that not all aspects at that time usually associated with agriculture and sedentary lifestyles were restricted to sedentary and agricultural communities, citing examples such as the hunter-gathering Jomon communities in Japan using pottery. She also noted that not all sedentary agriculturalists made pottery, writing of the earliest such communities in South-West Asia:

> 'Pottery, like settlement, is not a reliable indicator of the economic transition. It only gradually becomes associated with food-production and village life and is then invented and re-invented over and over again at different times and places' (Bender, 1975, 20).

Yet she does not quickly come to the same conclusion about "permanent" buildings and ascribes a self-evidence to sedentary hunter-gatherers in South-West Asia for which there is little other evidence. In her conclusions to that work, Bender wrote that, at that time, there was not enough archaeological evidence from enough areas to allow many definitive statements on the transition from hunter-gathering to farming. She noted that in South-West Asia, because of the concentration of excavation of small tell sites, 'early farming is usually seen in terms of the development of small peasant communities living in scattered villages'. The large tells such as Jericho and Çatal Hüyük which had been excavated were not consistent with such a concept, and Bender questioned whether early townships which could have been trade centres and been important in the transition to food production could lie beneath the other large tells such as Nineveh and Kirkuk. Her study of developments in Mesoamerica and South-West Asia showed that food production should not be viewed as a unilinear development. She concluded that because there was no single hypothesis to explain the transition to food production in different regions of the world, scholars should instead concentrate on the particular regional processes involved (Bender, 1975, 210, 215).

Still considering the transition from hunter-gathering to farming, Bender took a social perspective in a 1978 paper, suggesting that technology and demography had been given too much consideration and social structure too little in the explanation of agricultural origins. She wrote that it was important to separate food production (which is a question of techniques) from agriculture (which is a question of commitment) and posited that the question to be asked should be 'Why Intensification' rather than 'Why domestication'.

Commitment relates primarily to changing social relations, rather than technology. Bender wrote that intensification may not be associated with either social or demographic change if it relates to increased productivity, rather than increased production, and may have no relation to a commitment to food production. One potential trajectory lay in hunter-gatherer procurement systems where the regenerative capacity of wild resources was not enough to keep up with demand, and thus manipulation and eventually domestication of high-yielding plants and animals could be significant. Bender summed this up by saying:

> 'The enquiry into agricultural origins is not, therefore, about intensification *per se,* not about increased productivity, but about increased production and about why increased demands are made on the economy' (Bender, 1978, 204, 206).

Different explanatory models current at the time were critiqued by Bender in the 1978 paper, including demographic pressure, techno-environmental explanations and rapid population increase, and found them to be problematic. She noted that the use of ethnographic examples confused the issue, particularly because they relate to situations where they are more constant food supplies, new foods and better medical attention. There may have been constraints such as a lack of suitable food for early weaning which would, such as for the sedentary Oriomo Papuans, have led to continued long lactation, and Bender wrote that birth-spacing should not be confused with the result of a change of diet following sedentism (Bender, 1978, 208). She posited that gatherer-hunter bands could not be autonomous, and need reciprocal social relations in order to have access to different resources. She also wrote that there seemed to be no justification for drawing an evolutionary line between gatherer-hunter bands and tribal food producers as prehistoric gatherer-hunters societies were often tribal and more complex than contemporary ones (Bender, 1978, 210).

The effects of sedentary living vary, depending on the structure of the society and on environmental factors. Bender wrote:

> 'It enhances tendencies already present within the society. It permits the accumulation of material objects; permits permanent storage; facilitates increased production. The ability to store and to accumulate makes the control of labour and the fruits of labour … more desirable. As labour takes on value there is more reason to increase numbers (and the increase becomes possible because of the ability to store food against the lean seasons)'

She went on to posit that land would also have increased in value, and would have needed to be protected. Sedentism tends to lead to increased productivity and increased production, and would frequently have led to technological innovation (Bender, 1978,

213). Bender had begun systematic operational analysis of the way communities functioned, and had sidcarded some material-social correlates, such as ceramics, but not others such as durable buildings with no explanation for why the durable-sedentary correlate could not equally be criticised.

Bender noted some archaeological evidence showed that prehistoric social structures in the Late Pleistocene and Post Pleistocene were similar to contemporary hunter-gatherer groups. She noted that (at that time) it was only recently that assumptions about early farming communities in South-West Asia had been questioned, particularly with the excavations of Jericho and Çatal Hüyük, but still depended on farming and sedentism. Bender's interpretation theorised that trade and exchange went back much further than the Neolithic and were 'more closely correlated with increased sedentism (and the social developments that that signified) than with a change in the subsistence base'. Similarly in the Late Pleistocene in Europe there was evidence of permanent settlements and increasingly extensive exchange networks (Bender, 1978, 215). Her conclusion posited that while every society in every region had its own evolutionary trajectory, there was a similar hierarchy of causality. Social relations articulated society and produced the evolutionary pattern (Bender, 1978, 218).

In 1989, Bender analysed the reasons why scholars had considered farming as a necessary condition for 'complexity', and why the divisions in hunter-gatherer societies were desocialised and ignored. She noted that if food production became a significant subsistence strategy, 'it makes certain demands on social practice', often necessitating some degree of sedentism. There are delayed returns on the labour inputs, and successive generations benefit from the labour of previous ones. Land becomes something material, which can be possessed and controlled. Bender wrote that regarding farming as a technological precondition for social change legitimated concepts of property and control, while the lack of complexity in hunter-gathering societies is linked to the inability to control resources. She acknowledged that the level of technology available to a society did impose constrains on its social relations, but posited that it did not explain variability and change (Bender, 1989, 83-84). She concluded by writing:

> 'the beginnings of inequality do not start with the onset of farming, or with any other ecological input, they lie far back in the varied social configurations and ideologies of gatherer-hunter societies' (Bender, 1989, 93)

6.8 The 1980s

Jarman, Bailey and Jarman produced *Early European Agriculture: Its Foundations and Development* (1982) based on the work of, and as a tribute to, Eric Higgs. In this they hypothesised that seasonal mobility utilising some storage allowed a higher overall population than that which would have been possible if separate communities individually exploited local resources. They also noted that sedentism in hunter-gatherer communities was almost exclusively practised by coastal groups, particularly those with an unproductive or inaccessible hinterland (Jarman et al., 1982, 45-46). The continuing problem is that the sedentism of coastal groups remains proposed, not demonstrated, and relates to the conundrum of complex hunter-gatherers (see chapter 8).

In *The Origins of Agriculture: An Evolutionary Perspective* (Rindos, 1984) has a chapter on The Evolution of Domestication. In this, there is a sub-section on Domestication and Sedentism. Rindos noted that 'barring compelling evidence to the contrary, archaeologists tend to connect sedentism with agriculture and to accept evidence of agriculture as presumptive proof of a relatively sedentary life'. Rindos acknowledged that there were problems with this interpretation, but did not define sedentism or sedentary life. He posited that it was reasonable to assume that agroecology would require 'relatively permanent settlement or, at the very least, regular seasonal transhumance' (Rindos, 1984, 172-173). The issue, of course, is that if seasonal transhumance and perennial "settlement" are conflated, the notion of a difference between sedentism and mobility has no meaning.

Although Gellner wrote in 1988 that earlier 'steps' in history were preconditions for later steps, he qualified this by saying that the later steps were not automatic outcomes of the earlier steps, and that there was no universal law requiring every society to pass through the three principal stages of hunting/gathering, agrarian society and industrial society. He emphasised that although societies can remain in any stage, it was not possible to go from the hunting/gathering stage direct to industrial society, and that regression from industrial to agrarian or from agrarian to hunting/gathering, although improbable and rare, was possible. Gellner posited that, contrary to the 19th century philosophies, there is no inescapable destiny or inner necessity which forces societies to move from hunting/gathering to agrarian or from agrarian to industrial. Rather, he suggested 'the spontaneous, endogenous transition may well be inherently improbable, and due to a near-miraculous concatenation of circumstances (especially in the case of the second of these two great transitions)', partly because of the immense difference between the three major

different kinds of societies (Gellner, 1988, 15-16). In essence, he states that the issue is that the cause(s) of sedentism is unresolved.

In a 1989 discussion of the relationship between mobility and cultural complexity and the implications for sedentism, Kent wrote that most anthropologists agreed on a definition of cultural complexity but many less understand how and why it occurred. She asked 'why are horticultural societies more often socio-politically complex than are hunter-gatherer groups?', suggesting that the key was mobility, or nomadism, versus sedentism, observing that there were no past or present autonomous state-level societies with an ecomony completely reliant on hunting and gathering. She noted the options available when population density rose and people could not or did not want to move into less populous regions, writing:

> 'The option of importance here is restricted mobility, for whatever reason, resulting in sedentism. The preconditions for the development of complexity occur when increasing sedentism is combined with an environment that has potential for local or introduced predictable and storable surpluses of resources either from continual trade or through diffusion and local adoption. These preconditions can result in an intensification and localization of resource exploitation …… This leads to further sedentism and, importantly, aggregation which result in population increases.'

Kent pointed out that she was not implying that sedentism was the only factor in the development of complex societies but that it was a primary factor, particularly when aggregation was also present (Kent, 1989a, 10).

Summarising prevailing theories about storage and sedentism in the European Palaeolithic, Soffer noted that by 1989 scholars acknowledged that there was a significant amount of variability in hunter-gatherers, with their adaptations ranging from foraging to logistical organisation, from those that store and those that do not, ones with immediate and ones with delayed returns, and those which were sedentary and those which were not. Soffer posited that in the Late Palaeolithic in Eurasia there were sedentary groups such as the Natufian and the Jomon while those from the central East Russian Plain were seasonally mobile but used bulk storage. She noted that sedentism needed the requisite technology and organisational skills to be in place before it could develop, together with an assured food supply. Although others such as Rafferty (1985) had written that stress was the cause of a reduction of mobility in hunter-gatherers, Soffer posited that stress, per se, did not necessarily lead to sedentism. She also disagreed with the concept that sedentism pre-supposed storage, noting that such a connection was 'neither ethnographically not historically synonymous', although noting also that

'permanent storage is thus a *necessary* but not a *sufficient* condition for sedentism' (Soffer, 1989).

In 1989, Edwards wrote, in relation to the Broad Spectrum Revolution, that scholars sometimes assumed that the innate qualities of some food resources, rather than humans' use of them together with the organisation of their labour, led to sedentism or the achieving of food production. He pointed out that Binford, for example, had applied the concept to Southwest Asian aquatic resources, based on Northwest Pacific Coast groups. However, as Edwards noted, the Shoshoneans had, by choice, not developed ways to dry and smoke fish in order to store surpluses which would have enabled them to develop large permanent populations. Edwards theorised that abandoning the Broad Spectrum Revolution as a model for early Holocene Southwest Asia was consistent with scholars' recent use of other factors rather than simple environmental determinism to explain the origins of agriculture (Edwards, 1989b, 242).

6.9 David Harris

The reassessment of sedentism, considering it as an operation and a process rather than a definitional stage, was Harris' major contribution to the ongoing debate and discussion on the subject. In 2007, Harris wrote 'Progress in scientific understanding depends on the interaction of theory and data, with theory provoking the search for evidence and the evidence in turn modifying theory'. He qualified this statement in relation to the historical sciences by noting that it is less easy to apply experimental method to past situations which cannot be directly observed. Therefore, scholars depend to a greater extent on surrogate data, and Harris noted that this dilemma was evident in, for example, attempts to understand the emergence of agriculture (D. R. Harris, 2007, 16). His focus was both the development of agriculture and the issue of sedentism deriving hunter-gatherer mobility.

The marginal transition zones or ecotones between major ecosystems, particularly the forest- and woodland-edge areas, would have offered the best habitats for the gatherer-hunter-fisher communities who began plant domestication because they had the most reliable and variable supply of wild plants and animals (D. R. Harris, 1969, 8-9). In these transition zone areas, gathering of wild plants would have been easily combined with hunting herbivores and catching fish. The well-balanced and secure food supply would have 'reinforced tendencies towards sedentary settlement'. In turn, this would have provided greater opportunities for the selection of advantageous mutations of wild and

semi-domesticated plants, favouring the transition from plant gathering to harvesting to full domestication. Human disturbance of the local ecosystems around the permanently or semi-permanently occupied sites would most easily lead to the creation of open habitats which provided the most advantageous sites for colonisation by the weedy ancestors of later cultigens (D. R. Harris, 1969, 9).

In a paper first given in 1973, Harris spoke of recent ethnographic studies of hunter-gatherers which had demonstrated that population size in those groups was not limited directly by the availability of food and have generally stabilised below the maximum carrying capacity of an environment at any given level of technology. He moderated Sahlins' characterisation of hunter-gatherer life as 'the original affluent society' by commenting that it was based on studies of communities in tropical desert, semi-desert and rainforest environments, noting that it was uncertain whether hunter-gatherer groups in temperate or polar environments also lived at population levels below maximum carrying capacity. Harris stated that his paper made the assumption 'that past and present hunter-gatherer populations have normally stabilized at levels below the maximum carrying capacity of the environment exploited at a given level of technology'. Although some groups did increase in numbers, there is no indication in the prehistoric or ethnographic record of any overall trend towards intensification, although habitat differences do influence population size and density. If intensification had occurred, Harris suggested, agriculture would have developed much earlier as a widespread subsistence strategy (D. R. Harris, 1977a, 179-180).

Binford's 1968 challenge, 'the question to be asked is not why agriculture and food-storage techniques were not developed everywhere, but why they were developed at all' were addressed by Harris in three ways. He examined the stress factors which could have led hunter-gatherers to develop new subsistence strategies incorporating food production, proposed a general model for the transition to food production, and analysed specialised resource exploitation systems which could have served as alternative pathways towards agriculture (D. R. Harris, 1977a, 181). In this paper, Harris also discussed other theories of stressors leading to the development of agriculture (such as Childe's oases theory, Braidwood's 'inherent in human nature' theory, and Sauer's absence of subsistence stress as a necessary condition for the development of agriculture). Harris argued that the response to explanations of the move to food production which are couched in terms of physical environmental changes should be explicitly hypothesised in a way that can be tested against archaeological and/or ethnographic data, rather than as a rejection of environmental determinism. He posited that secular changes tend not to disrupt equilibria, that short-term catastrophic changes frequently lead to migratory responses,

and that changes of intermediate duration and magnitude are most likely to induce major shifts in subsistence strategies (D. R. Harris, 1977a, 184). In support of his suggestions, Harris cited the Northwest Coat Indians and the Ainu in Hokkaido, who had higher population levels, lesser mobility and greater cultural complexity. It has been commonly assumed that this was because of a local abundance of wild foods. However, Harris wrote that this assumption oversimplifies a complex subsistence pattern and, crucially, is not an evolutionary pathway leading to agriculture (D. R. Harris, 1977a, 219-220). The same logic could be applied to seeing the development of the complex hunter-gatherers as on a trajectory in their own right, rather than as on a path to another "stage" of sedentism.

Harris also argued that hunter-gatherer populations' ability to moderate their physical environment, and thus produce triggers for the emergence of agriculture, has been underestimated because their use of fire has not been considered in this context. He wrote that there are no other human-induced environmental changes that have the same stress factor potential as the burning of vegetation (D. R. Harris, 1977a, 185). Harris also noted that gathering of a wide range of wild foods would have led to reductions in logistical and/or residential mobility. This would have triggered population increases (D. R. Harris, 1977a, 192). Harris examined what stress factors could have led to hunter-gatherers incorporating techniques of food production into their subsistence strategies. He noted that little attention had been given to natural changes in the physical environment other than climate change as factors which might promote the emergence of food production, as changes in plant and animal communities were generally regarded as resulting from climate change or human activity. He also noted that hypotheses based on non-climate related changes could be difficult to test (D. R. Harris, 1977a, 183).

In addition, in 1977 Harris suggested that scholars' interest in the change from foraging to food production had hampered consideration of the more general process of cultural change. He wrote that scholars' concentration on discovering the origins of agriculture had deflected attention from the broader question of 'how mobile 'hunter-gatherer' bands gave way, as a dominant mode of human organization, to permanently settled, complex communities' (D. R. Harris, 1977b, 402). Harris also noted that scholars studying the emergence of civilisation had generally failed to consider the relationship between the many variables involved in the development of complex societies, instead proposing one main causal mechanism for the major societal and residential changes (D. R. Harris, 1977b, 401).

Harris discussed demographic change and whether it was likely that increasing population had been the norm since the emergence of hominids. He posited that if population growth

had been sustained it would be likely that it would have led to areas of local population pressure, with the consequent development of substantial sedentary settlements in some areas before the later post-Pleistocene village communities emerged. Harris noted, however, that the study of modern hunter-gatherer groups who lived with population densities well below their environment's carrying capacity provided better evidence that population increase had not been the normal condition in the past. He also noted that cultural regulation of births and deaths in hunter-gatherer communities could have been primarily related to band mobility (D. R. Harris, 1977b, 403). Harris also considered socio-economic factors as stressors in the initiation of the changes leading to agriculture, positing that while hunter-gatherer communities remained egalitarian, intra-group competition was unlikely to be a triggering stressor. However, when social stratification had developed in larger-scale communities with differing access to resources, intra-group competition was likely to have been a factor capable of promoting further intensification of production. If an elite emerged which was able to extract surpluses from a dependent population it would have been a powerful influence, but Harris theorised that it would be more likely to be causally related to the emergence of specialised agricultural systems and the beginnings of urbanism than to the beginnings of food production (D. R. Harris, 1977a, 186-187).

Binford's 1968 study of the recent change from mobility to sedentism in Nunamiut communities and Lee's 1972 study of Bushmen groups becoming sedentary were cited by Harris as demonstrating a causal relationship between reduction in mobility and increases in population. In Binford's study, the Nunamiut group's population doubled in the decade in which they became sedentary. This was partly due to a decrease in miscarriages but mainly due to the closer spacing of births, which resulted from reduced female mobility and shorter male absences on hunting trips. Binford's study also demonstrated that a change in subsistence from a narrow to a broader model of resource exploitation tended to lead to increased residential mobility and decreased logistical mobility. Harris drew the conclusion from Binford and Lee's studies that:

> 'if changes in the availability of a staple resource of wild food … are capable of triggering compensating adjustments in mobility, which in turn lead to an increase in population, then a spiral of population increase and intensified procurement of wild food may be inaugurated. This positive feedback or deviation-amplifying process will not necessarily result in a shift to food production, but we may postulate that the trend that it incorporates toward increasingly intensive use of particular resources may, if the necessary environmental and technological conditions are fulfilled, lead ultimately to agriculture.' (D. R. Harris, 1977a, 188-189).

Noting that there were higher population levels, greater cultural complexity and 'fuller sedentism' in the fishing communities of the American North-West Coast than in other ethnographically documented hunter-gatherers, which was generally assumed to have been made possible by the abundance of wild foods, Harris wrote that this was an oversimplification of what was a complex subsistence pattern, and which ignored the significance of seasonal variations in the availability of staple foods. Similar resource availability such as fish in tropical areas had not led to aquaculture, and was not an evolutionary pathway leading to agriculture (D. R. Harris, 1977a, 219-220). Harris wrote that although sedentism, at least partial, could be considered a necessary condition for the domestication of social ungulates, it was not a sufficient condition. This was obvious from the absence of domestication in semi-sedentary and sedentary hunter-gatherers and primitive agriculturalists who intensively exploited wild ungulates (D. R. Harris, 1977a, 223). Here the problem is what the term semi-sedentary, rather than semi-mobile, means, and what evidence has actually been provided that complex hunter-gatherers are "sedentary" in the famililar sense of permanently staying in one place.

In a lecture in 1990, Harris referred to the difficulty identifying archaeologically whether any pre-agricultural site had been occupied year-round or for long periods of time. He noted that in archaeologically well-studied regions such as Europe and Southwest Asia there had been sedentary settlements supported purely by wild plant and animal resources, yet these assumptions are not secure. Harris wrote that although various evidence (depositional, structural, artefactual and bioarchaeological) had been used in the evaluation of these settlements, they were all located at ecotonal boundaries, between ecosystems with varied resources. In Southwest Asia, Abu Hureyra and Mureybit had been extensively studied. Although there was less evidence from Mureybit, Harris theorised that by 8,000 BC, if wild grasses had started to be cultivated, then 'the inhabitants of the site would not yet have been farming, but they would by then have settled down and been systematically breaking ground'. He posited that it was not sufficient to merely show that the exploitation of wild plant and animal resources could support sedentary occupation, but rather to question why that lifestyle, in some areas, led to cultivation and agriculture (D. R. Harris, 1990).

Harris's last book, *Origins of Agriculture in Western Central Asia: An Environmental-Archaeological Study*, was published in 2010. In this, he and the contributing authors examined the beginnings of agriculture and sedentary villages in the Mesolithic and Neolithic and noted the complexities of the economy-residence relationship. They pointed out that in southern Turkmenistan there was 'a clear contrast between the

preceding Mesolithic hunter-fisher-gatherer economy and the mainly agro-pastoral economy of the Neolithic'. The Jeitun culture settlements in that area were established just before 6,000 BC and had mud brick architecture, some domesticated cereals and herded sheep and goats, with the inhabitants using chaff-tempered pottery. At the same time in the north of Turkmenistan and surrounding areas there was a mobile Neolithic culture, the Keltiminar, who did not practise agriculture (D. R. Harris, 2010, 59, 236). The quandary remains that if material markers such as durable buildings are the evidence for sedentism they are not secure indices, nor are factors such as deep depositions, which can result from repeated use of one location seasonally (see Edwards, 1989a, for example).

6.10 Conclusions

A change in focus in the consideration of issues relating to mobility and sedentism that took place between 1960 and 1990, particularly with the redefinition of the hunter-gatherer lifestyle as "affluent". Although this redefinition meant some scholars began to question why people had given up their "affluent" hunter-gatherer lifestyle and moved away from inevitable trajectories such as of complex hunter-gatherers towards sedentism, the self-evident linear stage progression model was still retained. There was a strong environmental emphasis in some of the scholarship, and more detailed research into early agriculture had changed scholars' views on the first farmers but this did not apparently lead to a sustained rethinking of the origins and processes of becoming sedentary.

Greater attention was being paid to more of the available evidence from archaeological investigations, particularly at the beginning of this period. In 1953, the Braidwoods had written that there had been, for the first time, significant investigation of prehistoric strata in Near Eastern sites in the previous two decades, but that there was still little comprehensive material available (Braidwood & Braidwood, 1953). This expanded massively from the 1970s onwards. There was considerable interest in the origins of agriculture and domestication, and their relationship to settling down. The period had started with view such as those of Glynn Daniel, who had written that in both the Old World and the New World, peasant village communities came into being from the dual bases of cultivation and animal domestication (Daniel, 1962, 164). Adams wrote in 1965 that population growth and increasing sedentism were linked consequences of the predictable harvests and food storage that came with agriculture, and led to the growth and merging of the original nucleated villages. He suggested that the transition from

food-gathering to food production was ‘one of a handful of crucial transformations that set off the whole human career’ (R. M. Adams, 1965, 33-34).

The issue of permanence was raised by Braidwood, writing ‘the question of year-round and year-in, year-out permanence is at issue’ in relation to the spread of settled farming communities, and he was inclined to consider architectural permanence as an indicator of a ‘proper village’ (Braidwood, 1967, 87-88, 120). Storage was considered important, and Flannery questioned whether the grain-gatherers in Harlan’s ethnographic experiment would have been able to remain free-moving or whether they would have needed some degree of sedentism in order to store and protect their collected grains (Flannery, 1969, 80). Binford asked the question of why agriculture and food storage were developed at all (Binford, 1968, 327). Binford also answered the criticisms of his early models relating to sedentism by saying that in the 1960s they had not known either the determinants of sedentism or its demographic effects (Binford & Chasko, 1976, 67).

Bender questioned why it had taken so long before agriculture was developed, and posited that it was necessary to understand the background of hunter-gatherers in order to understand the early farming communities. She considered the transition was gradual, not instantaneous, and noted that there had been an overlap in behaviours between the two communities, making it difficult to differentiate between them, and that the development of agriculture had not been unilinear (Bender, 1975, 1-3, 215). These crucial propositions were followed up by Harris in the development of a more operational analytic approach to the issue.

By reassessing sedentism as an operation and a process, rather than a transitional stage, Harris led the way for a change in the approach to the subject. He approached Binford’s 1968 challenge of why agriculture and food storage techniques were developed at all in three ways, examining the stress factors which might have led hunter-gatherers to develop new subsistence strategies, proposing a general model for the transition to food production, and analysing resource exploitation systems which could have allowed alternative pathways towards agriculture (D. R. Harris, 1977a, 181). Harris stressed the difficulty in identifying archaeologically whether a pre-agricultural site had been occupied year-round or for long periods. In his view it was not enough to demonstrate that wild plant and animal resources could support sedentary occupation, and that it was necessary to question why such a lifestyle led to cultivation and agriculture (D. R. Harris, 1990). The issues he raised remain unresolved.

During this time, many scholars conducted research to try to establish what constituted a sedentary settlement, and started to question some of the assumptions that had held for nearly three centuries. This led on, in the 1980s and 1990s, to several scholars such as Zvelebil, Rowley-Conwy, Renouf and Ayres seeking to extend the concept of sedentism to communities that were being defined as complex hunter-gatherers. The proposal was considered further in the decades that followed, and some of the scholarship relating to it will be discussed in Chapters 7 and 8.

Further consideration was also given to the so-called "material indicators of sedentism", and several seem to be rather taken for granted as if they are "self-evident", such as durable buildings. But concurrently no consensus was reached on how sedentism should or could be defined, and it does not appear that there was a general awareness of the fact that there was inconsistency in the application of the term. Scholars used many different definitions, referring to communities being, for example, fully sedentary, substantially sedentary, seasonally sedentary, partly sedentary, in transition to sedentism and so on, whereas all but the first of those descriptors could also be used to describe mobile communities. This is the period in which the problems caused by these ambiguities really began to hinder resolution of the issues involved despite expanding research on the topic.

Chapter 7: Into the 21st Century: The 1990s and beyond

'Over the decades, the Neolithic has been many things to those who study it: a chronology, a technology, a culture, an economy, a population, a social system, an ideology, and now a conceptual scheme' (Whittle & Pollard, 1998, 231)

7.1 Introduction

Since 1990, the number of articles and books published which seek to deal, at least in part, with the subject of sedentism has burgeoned. However, some books and articles which are stated to be about sedentism do not go into great detail on the subject, nor do they usually specify a definition of sedentism *per se*, or even what criteria they themselves are using for classification – thus the ambiguities continue to the present day. Some of the publications in this time period report on the use of more recent technological innovations to try and refine previous conclusions about residential status or to provide new ones. In some cases, the use of these technologies has led to the revision of previous assumptions about the former use of a site. Although many books and articles covering sedentism and the transitions to it were published in this period (some of which are listed in Chapter 2) it appears that in some ways there is a withdrawal from the zeal with which archaeologists in the previous three decades had sought answers about the residential status of people in the past. Johnson, for example, did not mention transitions to sedentism in his popular textbook *Archaeological Theory: An Introduction*. The closest connection was in a discussion of cultural ecology, outlining the use by archaeologists of ideas such as site catchment analysis, optimal foraging theory, risk and seasonality (Johnson, 1999, 144).

The discussion of sedentism and associated topics during this time is still not coherent. There is considerable detached hypothesising, using differing indices and criteria and varied definitions of sedentism, leading to a disjointed consideration of the topic. The discipline behaves as if "sedentism" is still somehow self-evident, thereby creating ambiguity. Considering it as self-evident has sometimes led to declarations of sedentism, rather than an actual demonstration of its presence in the archaeological record or an appraisal of the processes involved.

During this period, research on hunter-gatherer lifestyles has continued with vigour. As was noted in the last chapter, there still appears to be more literature on complex hunter-gatherers and reflection on how reassessments of their residential status need to be made, particularly with cultures like the Jomon and the Natufian, than there is on what was

involved in the change to a fully sedentary lifestyle. Kelly published his seminal 1992 paper *Mobility/Sedentism: Concepts, Archaeological Measures and Effects* at the beginning of this period. However, although covering a very wide range of issues, it too was slanted to the more mobile end of the residential spectrum. Nevertheless, Kelly did cover many of the important topics and problems, which has helped in the understanding of the issues associated with the study of sedentism.

One avenue of research that was pursued for this chapter was to assess how the topic of sedentism was dealt with in this period in selected books published in four archaeological series – *Cambridge World Archaeology, New Studies in Archaeology, Blackwell Studies in Global Archaeology* and *One World Archaeology*. In fact, few of the books researched contained more than brief mentions of the topic and some covering prehistory did not even include it in the index. Notable exceptions include *The Limits of Settlement Growth* (Fletcher, 1995), *Archaeology of Syria* (Akkermans & Schwartz, 2003) and *Archaeology of Asia* (Stark, 2006).

General agreement is lacking on the main drivers in the change to a sedentary lifestyle. Among other factors, climate change and population pressure are often cited. Eerkens pointed out that it is not easy to measure population change, either increasing or decreasing, particularly from a single or limited number of sites. As an example, in relation to the theories of climate change being the major driver for a transition to sedentism, Eerkens noted that in the early Haiwee period in California, c. 500 BC, when sedentism is said to have developed, there was no evidence of significant climate change or of a deterioration of the resource base in the area (Eerkens, 2003, 308). Kelly theorised that population growth could force communities to become sedentary, proposing that ethnographic examples showed that changes in women's foraging practices could increase fertility, and that this would cause population booms. One reason for the change may be that as women became more involved in resource processing they breastfed less. The change could also be related to decreased aerobic activity as well as dietary and caloric intake changes. Reduced mobility could also decrease child mortality, leading to increases in population (Kelly, 1992, 59). Harris wrote that spreading out births was advantageous to mobile hunter-gatherers, who had to carry babies and infants for most of their first three years. Suckling them for up to four years had a suppressant effect on ovulation (D. R. Harris, 1977b, 407). He also commented that settling down increased fat retention and likely inhibited conception (D. R. Harris, 2008, pers. comm.).

Varied factors have been proposed as initiating causes. Some scholars have argued that socio-political structures were needed as group size, storage and sedentism increased in

order to cope with increasingly complex relationships. Hodder and Cessford noted that archaeologists working in the Near East have theorised that agglomeration of sedentary settlement has been associated with regulation of conflicts through the centralisation of ranking, rituals, symbolism and public space (Hodder & Cessford, 2004, 17). Others refer to climate change. Sea-level rise during the Holocene is said to have led the Neolithic hunter-gatherers in Korea to move from semi-sedentary to sedentary living. In relation to this, Norton concluded:

> 'people do not normally change a subsistence strategy that worked fine for thousands of years just for the sake of change. There is usually a motivating dynamic involved. In this case, in addition to increasing social complexity, there were likely a number of equally important factors, including rising sea level, long-term effects of sedentism, increasing population pressure, and territorial circumscription that prompted many of these changes' (Norton, 2007).

Despite the plurality of explanations and propositions relating to the transition to sedentism, there is no consistent agreement. There is also no dominant model which provides conclusive answers or an agenda for research. The remainder of this chapter seems simply to demonstrate the diversity of views, the lack of concurrence and the tendency to retain older conventional assumptions, despite the development of a more rigorous analytic approach.

7.2 The 1990s

Writing in 1990, Hodder suggested that humans could have avoided the need for sedentism at the time when social groups began to aggregate in the Near East in the Late Pleistocene and Early Holocene. He wrote that they could have dispersed, used infanticide to reduce population levels or relocated. Hodder raised the issue of why they chose sedentism and the increased labour it involved, when living in larger social units involved less flexible and immediate responses. He noted that the evidence of storage in the Natufian period suggested an increase in societal-wide behavioural control for the protection of a household's stored resources, and that this would have led to social structures becoming better established, of longer duration, and with increasing social dominance (Hodder, 1990, 37-38). The early Neolithic of South Eastern Europe was summarised by Hodder as evidencing 'the beginning of a social strategy that later becomes more elaborate'. Settlement units were small, with some evidence of planning and were often 'semi-sedentary'. He posited that the concept of the domus was evident in

the 6th and early 5th millennia before larger, more sedentary social units began in the following millennia (Hodder, 1990, 52).

In 1992, Kelly highlighted the fact that most definitions of mobility are based on behavioural criteria without necessarily considering the cultural component. He theorised that there might be differences in the way hunter-gatherers bonded to an area or a physical place, depending on their cultural attachment, or lack thereof, to it. Kelly made the important point that foragers do not always move as one consistent group, and that forager group composition can change easily. He noted that residential mobility could be culturally valued, although it was 'unlikely to account for large-scale evolutionary trends'. This could mean that some communities remained mobile even in areas where sedentism was possible, using mobility to maintain cultural independence (Kelly, 1992, 45-48).

In a 1992 discussion of the PPNA period in the Levant, Byrd wrote that only a few sites of 'sedentary food-producing villages' had been excavated which had evidence of systematic exploitation of the main Levantine crops. He noted that there was not as yet enough evidence of how the spread of agriculture had taken place across the Levant, and whether it was through colonisation or the adoption of domesticated plants by local hunter-gatherer groups. Byrd hypothesised that during the PPNB period it would have been necessary for communities to move from relatively residentially organised settlement systems to logistically organised ones in order to become sedentary, although there were actually no known unequivocal examples of this change. In the late and final PPNB (post 6,500 BC) there were sedentary farming villages with elaborate rectangular architecture in some parts. However, Byrd wrote that in the east-central Levant and the Negev and Sinai it was possible that there was a reversion back to a seasonally mobile hunter-gatherer economy at that time (Byrd, 1992).

Haiman reported on a survey of Early Bronze Age sites in the Western Negev Highlands, a climatically harsh environment, and attempted to define permanent sites and sites that reflected seasonal pastoralism. Importantly, he noted that archaeological discussion of the terms sedentism and pastoralism is based on physical remains, rather than on a study of the actual society, and therefore if there is no physical evidence available, the discussion is purely theoretical (Haiman, 1992, 93-94).

In the 1995 edition of his work *Ancient North America: The Archaeology of a Continent*, Fagan had a section entitled 'The Issue of Sedentism' in which he discussed the possibility of the claims for year-round settlement in floodplain midden sites in the Midwest and Southeast during this period. He posited that they were in fact permanent to

semi-permanent, dry-season base camps, with the inhabitants moving to higher ground in wet seasons. Fagan cited this as an example of a change from 'free-wandering' with no base camps to 'centrally based wandering', or a seasonally mobile lifestyle with a return to the same base location year after year, with the change taking place after 4,500 BC. Interestingly, Fagan used the term 'seasonally mobile' rather than 'seasonally sedentary' (Fagan, 1995, 367-368). He went on to note that 'a trend toward more sedentary settlement began in the Middle Holocene', suggesting that greater aridity may have restricted mobility. Fagan also noted that permanent base camps allowed for greater food storage, providing for larger populations, the control of labour, and the trading of luxury items. Food storage and processing of food was enhanced with the development of waterproof ceramic containers (Fagan, 1995, 376-377).

Domestication was not introduced across different regions at a uniform rate. Roberts noted that in the Near East, agriculture quickly replaced hunting, fishing and gathering, whereas in Mesomerica, with few animal domesticates, the process took at least 3,500 years. Roberts did note, however, that in the Near East the change to sedentary agriculture from a mobile hunter-gatherer economy was not instantaneous, but had involved a transitional stage of experimentation and variation in economies. He also noted that by the later pre-pottery Neolithic (c. 8,500-7,300 BC) there were 'fully fledged farming villages' throughout the Fertile Crescent and into western Turkey. These sites suggested communities of hundreds to thousands, with a largely agricultural base (N. Roberts, 1998, 130, 135). Roberts also discussed what he termed 'fully sedentary' communities around the lake-shores of the basin of Mexico from c. 7,000 BC, about four thousand years before agricultural villages began. He noted that sedentism was possible there because of the year-round availability of wildfowl and fish (N. Roberts, 1998, 151-152).

There was considerable discussion in the 1970s, 1980s and later, on the role of causewayed enclosures in England, particularly whether they were used as ceremonial centres, defensive encampments or in domestic contexts. Bradley noted in 1998 that interpretation of such enclosures in Continental Europe could not be used to interpret the English ones, particularly because material culture artefacts carry different meanings depending on their contexts (Bradley, 1998, 189). Harding noted in the same book that 'familiar and well-excavated monuments are used as structural "norms" or fixed archetypes for different classes of site' in the study of the lowland English Neolithic. She also wrote that scholars had made little effort to interpret 'the wider social implications of specific forms of architecture and spatial layout', positing that until that happened, the structural and symbolic traditions would be misconstrued, and lack consideration of site

design (Harding, 1998, 204-205). In further discussion of the symbolism of causewayed enclosures and monuments, Whittle and Pollard commented:

> 'most authors assume on theoretical grounds that hunter-gatherers need to be (semi-) sedentary and (semi-)complex, as well as ubiquitous, before adopting "Neolithic" ways, even when the archaeological evidence is often for sparse, mobile populations'.

As one example of this, they quoted Patton's citing of sparse shell middens in Brittany (Patton, 1993, 37) as evidence for 'large, settled coastal communities'. Whittle and Pollard also noted that many contemporary scholars were, without real supporting evidence, identifying monuments as a means by which scattered mobile communities 'could be encouraged to embrace new concepts of community, identity, and adherence to chosen places, and to accept the routines and constrains of more settled life and of agriculture' (Whittle & Pollard, 1998, 231-232).

In 1998, Lieberman had described sedentism as 'an elusive, if not tenuous, concept that has recently captured the attention of many archaeologists'. He noted that reduced mobility strategies in hunter-gatherer communities had several important implications. They could indicate an anomalous strategy for non-agriculturalists, with the likelihood of more complex societies, larger group sizes, higher fertility and greater storage and exchange (Lieberman, 1998, 75). This proposes a set of associations, but does not specify how operationally they related to generate sedentism.

7.3 The 2000s

In a comprehensive publication on the site of Abu Hureya, in current-day Syria, Moore, Hillman and Legge noted that it was one of the few sites which showed the development from a settlement of hunter-gatherers to an early farming settlement, which they termed a village (A. M. T. Moore et al., 2000, v). They discussed the likely occupation times for the different sequences of the village. In relation to Abuy Hureya 1 they wrote:

> 'The answer to this question is of fundamental importance because, in Southwest Asia, the inception of sedentism is often associatied with the development of village life based on agriculture. The transition to sedentary life is usually accompanied by changes in social organization and can have important demographic consequences. We need to know, therefore, when sedentism began and how it was related to the shift from foraging to farming.'

Moore, Hillman and Legge reported that the archaeological evidence, particularly the food resources, 'implies that the site was occupied year-round' and over a long time-span

covering 1,500 years (c. 9,500-8,000 BC), although they cautioned that such inferences could never be conclusive. They also theorised that the majority of its inhabitants had remained close to the site year-round, with others leaving for a few days at a time to hunt or gather raw materials (A. M. T. Moore et al., 2000, 481-484). The problem is that this is a closed loop of hypothesising without test and without a specified necessary uniformitarian position to make any of the claims logically valid. Because the site looks like a "village", the term sedentary is introduced. This may well be a correct assumption, but an assumption is what it remains.

Belfer-Cohen and Bar-Yosef wrote that in the Levant, although the earliest evidence of sedentism is in the core-area sites of the Early Natufian, later instances seem to reflect local adaptations, and were sporadic and unconnected. They theorised that the intensification of artistic activities, such as the making of beads and pendants, during the Natufian period could be considered as a method of alleviating scalar stress arising from the intensive social interactions that come with sedentary living and speculated that such artistic activities could also have provided a mechanism for creating group identity and group loyalty. Belfer-Cohen and Bar-Yosef posited that sedentism and foraging were 'primarily opposed to each other with respect to the long term success of a population' because of the population growth that happens with restricted mobility, and which cannot be sustained by fixed natural resource availability. They quoted Keeley, that 'complexity creates resource stress – resource stress does not create complexity', and proposed that while the complexity of societies of specialised hunter-gatherers promoted sedentism and the formation of social hierarchies, it also led to the failure of sedentary foraging (Belfer-Cohen & Bar-Yosef, 2000, 23, 25, 32).

Recent aquatic-based hunter-gatherer communities have tended to be more residentially stable, have higher population densities, and possibly to be more socially and economically complex than their predominantly terrestrial-based counterparts. They had generally made few residential moves per year, partly because they were tethered to winter stores and to water sources. Ames noted that the nature of such movements made it difficult to distinguish between the residential move of an entire settlement and what was just a logistical foray by some of its members (Ames, 2002, 19, 43-44).

An article by Bar-Yosef entitled 'Natufian: A Complex Society of Foragers' has a sub-section entitled The Cyclical Nature of Sedentism. In this, he notes there were ambiguities in the interpretation of material from the Pleistocene, but 'one can assume that in general villages and towns of Chalcolithic or Bronze Age periods can be taken as evidence of sedentism'. He did caution that, based on ethnoarchaeological evidence,

'labeling prehistoric sites sedentary requires a careful approach' (Bar-Yosef, 2002, 103). Although it is likely that the Chalcolithic and Bronze age villages were sedentary, it does not resolve the earlier conundrums and the ambiguities are inherent to the discussion.

In their introduction to *Beyond Foraging and Collecting*, Habu & Fitzhugh noted that long-term changes in hunter-gatherer subsistence-settlement systems had seldom been considered by scholars. The primary focus of Binford's 1980 forager-collector model had been the annual cycles of subsistence activities and the resulting settlement pattern changes, and Habu & Fitzhugh suggested that instead it would be useful to develop models of changes taking place over hundreds of years (Habu & Fitzhugh, 2002, 2).

The history of the nomadic and sedentary communities in South Asia and their interactions were traced by Casimir and Rao (2003), who noted that in the Early Mesolithic, nomadism was still the main economic base for communities living in unpredictable environments, with a few communities living in biologically diverse environments that enabled them to lead semi-sedentary or possibly even sedentary lifestyles. In the Late Mesolithic, as plant and animal domestication began, there were nomadic communities with a foraging and cultivating economy living in close contact with sedentary communities with whom they exchanged food products. By the Neolithic there was evidence of both domesticated and wild animal bones in sites, suggesting that agriculture could have been supplemented with other subsistence strategies and the possibility that communities had moved between different lifestyles. Casimir and Rao wrote that sedentism in South Asia increased with the onset of the Chalcolithic and that by the 3rd millennium BC, villages had been established in favourable ecological zones, albeit with exchange systems with existing hunter-gatherer networks (Casimir & Rao, 2003, 46-48).

Akkermans and Schwartz noted that the beginning of the Natufian assemblage period had brought a series of major changes to the forager way of life in Syria, although it had been a gradual process taking many generations. They noted that there was evidence that communities had stayed in one place for longer periods of time, although the patterns of subsistence and settlement varied through Syria and the Levant, with the first villages still having a subsistence economy based on hunting and the gathering of wild plant resources. Akkermans and Schwartz wrote that in the Euphrates area in the 12th millennium BC, sedentism had only applied to a small number of people, with villages being an isolated occurrence until c. 7,500 BC, when there was a proliferation of hamlets and villages. They wrote that a sedentary lifestyle based on hunting and gathering had been a prelude to the beginnings of the farming communities in the 9th millennium BC. Ackermans &

Schwartz posited that where resource patches were further apart, the communities might have stopped moving residentially. They also theorised that annual gatherings of large groups could have taken place in times of plenty at sites such as Abu Hureyra when gazelle herds arrived and wild plants were ready for harvesting. They wrote that the full-scale adoption of agriculture and stock-rearing had not occurred until the late 9th and 8th millennium BC (Akkermans & Schwartz, 2003, 25-49). This does not, however, necessarily mean that these communities were actually sedentary.

Renfrew had posited that sedentism was one of the major transitions in human cognitive evolution and that most of the developments of material culture had occurred around this time (Renfrew, 2003, 115). Clark discussed Renfrew's thesis, that sedentism allowed a greater engagement between humans and the world, with human culture becoming more substantial and more material, particularly in relation to Mesoamerica (J. E. Clark, 2004, 207). Clark noted that in his and Cheetham's study of traces of Late Archaic settlement in Mesoamerica, the beginnings of village life and subsequent development of social ranking had supported Renfrew's position. This was 'that sedentism was more significant than agriculture in evolving social engagements', and that there were no obvious changes in agriculture at the time of the beginnings of sedentary village life there (J. E. Clark & Cheetham, 2002).

In a study of the Mesolithic and Neolithic of the British Isles, King noted that the archaeological assemblages he studied could be interpreted as the remains of either a highly mobile population with short-term visits to an area or as evidence for "short-term sedentism", partly because of the lack of temporal data and palimpsest effects. He theorised:

> 'Different populations across Britain and Ireland could have had different levels of mobility at different times of the year and in different decades or millennia; identifying a general trend is difficult. ……. Even though substantial structures were being built by the population this does not mean that the people were not mobile.' (King, 2003, 267-268).

The Mesolithic site of Star Carr in North Yorkshire has been the subject of intense archaeological investigation and interest for more than sixty years, particularly with the excavations carried out by Grahame Clark from 1949, which classified the site as a residential base camp, used in the winter and spring by a small group of mobile hunter-gatherers, and it has continued to be used as a model for many other field studies worldwide. Lane & Schadla-Hall noted that despite current acceptance of the variability of hunter-gatherer settlement systems and practices and despite several new studies of the

site, there has been an ongoing belief in European Mesolithic studies that Star Carr was typical of an Early Mesolithic lowland settlement and that similar examples would be found in the future (P. J. Lane & Schadla-Hall, 2004, 145-151). However, recent excavation of what was regarded as the remains of the oldest known house in England, in North Yorkshire, (c. 8,500 BC) have led scholars to challenge these interpretations, with the possibility that such structures indicate a more settled way of life (Wainwright, 2010 and other media reports), suggesting that the definitions of mobility and sedentism are still in an unstable state of flux. Writing a general interest book on the archaeology of Star Carr, Milner and colleagues noted that in recent years many Mesolithic sites in the U.K. had yielded evidence of houses 'which seem to suggest an alternative view to the idea that people were highly mobile' during that period. One such 6m diameter structure at Howick, in Northumberland, provided evidence of the way Mesolithic buildings were constructed. Statistical modelling indicated that it had been occupied for at least a hundred years, suggesting that communities would have had a lasting relationship with particular places. Milner and colleagues wrote that this did not mean that such communities always remained in one location. One of the structures at Star Carr is currently the oldest known 'house' in the UK, dated at c. 9,000 BC, considerably earlier than the Howick house, although they noted that it may not actually have been used for habitation (Milner, Taylor, Chantal, & Schadla-Hall, 2013).

Using two Danish sites as a basis for consideration, Bradley discussed Renfrew's 'sapient paradox', referring to Renfrew's theory that most of the development of material culture coincided with the development of agriculture rather than with the time of the emergence of the modern human mind. He noted that he had chosen the two sites because there was no conclusive evidence that they were year-round settlements, partly because it was not possible to precisely reconstruct seasonality from their food remains. Bradley emphasised that, despite frequent conflating of the issues by scholars, it is necessary to distinguish between the domestication of plants and animals and sedentism. He classified domestication as 'essentially a social relationship because it involves the ownership of those resources'. He noted that ownership was sometimes cited as a reason for communities becoming sedentary, and outlined ways in which domesticated crops could have been guarded from predators without the presence of their cultivators, and stressed 'the exploitation of domesticated animals does not imply sedentism'. Bradley's conclusions included:

> 'The first use of domesticates involved a new conception of the relationship between human beings and the environment in which they lived. Mesolithic societies participated in the natural world; Neolithic communities acted upon it. …

> Although the use of domesticates usually involved some degree of sedentism, it did not necessarily do so. Nor did material culture change its character significantly in more stable settlements where the economy was based entirely on wild resources' (Bradley, 2004, 112-113).

In 2004, Gamble argued that 'looking for revolutions, either symbolic or sedentism, to identify and explain change in archaeology will not produce satisfactory results'. In that paper, Gamble took a Palaeolithic standpoint, looking forward to the Neolithic, rather than looking back from the present, as is often the way scholars approach the issue (as discussed in Chapter 1). His paper was concerned with the change in use from what he classified as 'instruments' in the Palaeolithic to 'containers' in the Neolithic. Gamble noted that these material objects had been in use for a very long time and were not associated with the beginning of food production. He wrote:

> 'the explanation for the appearance of crops and flocks, villages and graveyards, must do two things; First, have a wider appreciation of how such examples of material culture acquired symbolic force in a network of materiality; and second, address their significance as changes which need explaining over the timescale of human evolution' (Gamble, 2004, 93).

In the Americas, the domestication of maize and the amount of time invested in its cultivation had a great impact on the populations growing it. The premise is that less time was available for foraging for other food sources, leading, through longer stays at wet-season campsites, to village farming throughout Mesoamerica, although Evans noted that in some areas this may have happened later than traditionally assumed. In discussion of the Middle Archaic in the Basin of Mexico, Evans noted that the available archaeological evidence in the earliest phases at Zohapilco was 'not sufficient to prove permanent sedentism' even though the site had been occupied both in the wet and the dry seasons (S. T. Evans, 2004, 90-91).

The findings of Kirkbride's excavations at Beidha, Jordan were published in 2005 by Byrd, who wrote that sedentary hunter-gatherer communities which were contemporaneous with the later part of the Natufian period had been documented in the Taurus-Zagros flanks. He commented that the continuously occupied early Neolithic village of Beidha fell into the Middle and Late PPNB timespan, but some of the nearby communities from that time had social and economic systems similar to those of prior periods. Byrd also commented that, while recent models of the transition from semi-sedentary hunter-gatherers to sedentary food-producing villagers had focused on the initial changes in subsistence and settlement patterns, less attention had been given to the

changes in social organisation which followed. He posited that the establishment of agricultural village economies would not be understood 'without detailed examination of the community organization', and that investigation of the built environment would reveal organisational patterns and trends. He noted that, with the exception of the investigations at Beidha, there had been no significant studies of the changes in community organisation related to the beginnings of sedentism and agriculture in the Near East, mainly because of the lack of adequate databases and the lack of sampling of early occupation horizons (Byrd, 2005a, 1-4). In summing up the changes in the spatial organisation at Beidha through time, Byrd noted developmental changes which included an 'increased discreteness of individual households as the focus of activities and production', together with the appearance and then expanded importance of distinctive, significantly larger 'corporate buildings'. He proposed that there was substantial archaeological evidence of 'community-wide mechanisms for promoting group integration and cohesiveness' appearing during the transition to sedentism (Byrd, 2005a, 128, 134).

Scholars rethinking the Neolithic in the 1990s, and previously palaeoeconomists in the 1970s and early 1980s, had worked to break down the traditional concepts of a Neolithic package of farming and sedentism. Halstead wrote that despite differing theoretical backgrounds, both groups had emphasised the variations in the European Neolithic and the necessity to consider it in both local and regional contexts. He posited that these scholars had not paid enough attention to the archaeological record and had replaced the previous model with an 'equally unfounded pan-European orthodoxy of gradual and piecemeal adoption of domesticates, sedentary life and Neolithic material culture'. Importantly, he argued that before it was possible to posit a largely sedentary Greek Neolithic it was necessary to clarify the terminology of sedentism (Halstead, 2005, 38).

Reassessing the transition to sedentism in the Near East, Byrd argued in 2005 that:

> 'the onset of sedentary, complex hunter-gatherers and then later the widespread occurrence of large food-producing villages were fundamental milestones that dramatically changed the social landscape. I argue that both were rapid rather than gradual events, took place during optimal climatic conditions, and occurred in the most productive portions of the Near East…… Sedentary, complex hunter-gatherers emerged at the onset of the Natufian, associated with population aggregation, resource intensification, surpluses, and major changes in group dynamics, social interaction, and ideology' (Byrd, 2005b, 232).

He argued that initial sedentism and the origins of cultivation should be separated from the processes of domestication, in order that complex hunter-gatherer social systems could be considered. Byrd noted that recent causal factors posited for the transition to

sedentism in the Near East had included environmental stress, population increases and decreases, and social changes. He wrote that the social developments of sedentary hunting and gathering, followed 3,000 years later by agricultural village life, had taken place in favourable climates in resource rich areas, rather than in marginal areas or under environmental stress (Byrd, 2005b, 236-237, 252).

An increased number of settlements have been identified relating to the beginning of the 3rd millennium BC, in the Early Bronze Age, in the Malatya Plain in Eastern Anatolia. Di Nocera theorised that the nature of those settlements indicated that this did not in fact mean an increase in population numbers, but rather that there was greater population mobility and therefore more sites (Di Nocera, 2005, 67). This seriously complicates the claims for increased population pressure.

In their discussion of early communities in East Asia, Underhill and Habu considered differences in the ways in which economic and socio-political complexity emerged. Neolithic communities in China from c. 8000-2000 BC became farmers (primarily millet in the north and rice in the south), with pottery vessels and ground stone tools, and with 'sedentism rather than seasonal mobility'. Underhill and Habu posited that the domestication of the dog was a further indication that people were living in one place for longer periods each year and that 'increased reliance on pottery vessels probably was linked to increased sedentism'. They also suggested that as hunter-gatherers in northern China c. 8,000-6,300 BC became more reliant on cultivated plants, they became more sedentary in order to defend their crops during harvest. They theorised that as communities in East Asia became less mobile, it was likely that this led to greater care in their treatment of the dead (Underhill & Habu, 2006, 122-124). Underhill and Habu also discussed the development of complex hunter-gatherer cultures in Japan and Korea, both regions where claims for equivalence with the European and Chinese Neolithic have been made on the basis of pottery, polished stone axes and putatively sedentary villages. The Jomon and Chulmun people also had food storage, subsistence intensification, ritual and craft elaboration and long distance trade, and Underhill and Habu noted that although the two cultures had characteristics of 'complex' hunter-gatherer communities, there was considerable regional and temporal variability (Underhill & Habu, 2006, 134-135). They wrote that compared with evidence they examined from the Chinese Neolithic, the Jomon and Chulmun cultures indicated that 'unilinear models of cultural evolution or environmental determinism do not sufficiently explain the observed variability'. They also noted that the development of agricultural economies with fully sedentary communities did not occur everywhere in East Asia, even when the supposed prerequisite conditions occurred (Underhill & Habu, 2006, 142).

There were frequent grinding stones and dense deposits at many Early Holocene sites in Egypt, with claims for potential perennial habitation in some places, and in other places movements in restricted locales with abundant wild plant foods and aquatic resources. Wengrow noted that the earliest farming communities in Upper Egypt and the Sudan, c. 5,000-4,000 BC, actually 'show little sign of a village-based existence', with little trace of permanent architecture. Wengrow wrote that cereal farming began in the early centuries of the fourth millennium BC, together with developments in water transport, leading to long-term occupation at key areas of contact between the Nile Valley and the resource-rich hinterlands. He noted that mud-brick and plaster architecture, that is, use of durable materials, indicated increased sedentism with clustering of smaller units rather than pre-planned settlements. The only clear evidence of "permanent" village life in the Neolithic period in Egypt came from Merimda Beni Salama, on the edge of the Nile delta and that, surprisingly, there had been no scholarship on the reason for the lack of such villages. Wengrow noted that despite the lack of evidence of permanent dwellings or organised sedentary life elsewhere, many other scholars do describe the Nile Valley Neolithic habitation sites as villages, settlements, homesteads or hamlets (Wengrow, 2006, 19-34, 63).

Hodder pointed out, in *Catalhoyuk: The Leopard's Tale: Revealing the mysteries of Turkey's ancient 'town'* that he had been describing details of daily life and the changing relationship with material things. He noted 'this changing relationship with things is the slow process that lies behind the shifts we call the emergence of village life, agriculture and social inequality'. He posited that in small-scale hunter-gatherer communities people were involved in 'immediate short-term relationships with the environment, with other people'. Once people began living in larger communities, they developed more long-term commitments and greater involvement with durable materials and social interactions (Hodder, 2006, 237-238).

Sayre analysed ethnohistorical narratives concerning early agriculture in the Americas to demonstrate differences in concepts in differing parts of the world. He noted that the Hopi had a tradition that they were told to remember a particular type of corn, because they would build villages, then leave to go on long migrations to build another village and begin again. Sayre theorised that this meant that the introduction of a staple crop did not necessarily lead to a completely sedentary way of life. The narratives of the Tolupan in Honduras related that people were living sedentary lives in villages before they were given maize and other crop plants. Maize was the last staple to be retained by the Ka'apor of the Brazilian Amazon when they became almost completely nomadic, after

having previously been more residentially stable with many more crops. Sayre noted that if the returns from a domesticate were not worth the social lifestyle changes, then some plants might be abandoned for ones which were less demanding, or the community might return to gathering or use of semi-domesticates. He noted that 'at times, domestic plants came before what we may conceive of as the *domus* and did not lead to predictable changes in social life, eg. sedentism' (Sayre, 2007).

In the same volume, Van Grunderbeek and Roche discussed multidisciplinary evidence for early agriculture in the Urewe culture people on the Rwanda-Burundi Central Plateau c. 100-500 AD, where there was evidence of a mixed farming economy with some indication of gathering activities in the savannas and at the forest edges. They suggested that the diversity of forms of the ceramics, mainly pots and bowls, suggested 'sedentary husbandry activities, perhaps supplemented by agriculture'. They noted that they were not characteristic of nomadic or transhumant lifestyles, where a single, multipurpose form of roulette-decorated pottery was used (Van Grunderbeek & Roche, 2007, 299, 314). Herding of domesticated animals preceded crop cultivation by several millennia in Africa. Kahlheber and Neumann noted that there is a need for mobility with foraging and pastoralism, and the high mobility of hunter-gatherers and pastoralists in the Sahara and adjacent savannas had delayed the evolution of farming longer there than on other continents (Kahlheber & Neumann, 2007, 320).

Halliday questioned previous assumptions that Bronze Age hut circle groupings in Scotland were the remains of continuous sedentary settlements. He noted that settlement patterns in Scotland in that period were different from those in southern England, which had farms and field systems similar to those pertaining today. In the north, typical settlements were composed of disarticulated agglomerations of buildings with banks and clearance heaps from multi-period occupations over several millennia. Halliday noted that it was not possible to assess how long individual houses had lasted or were occupied for, nor the relationship between adjacent structures. He theorised that scholars' identification of the settlements as representing continuous use came from preconceptions and definitions of settlement, and suggested that the question that should be asked is not whether the houses could have been occupied for lengthy periods but whether they actually were. Halliday concluded that 'the majority of round-houses in northern Britain are simply not complex enough to have been occupied for long periods'. He theorised that most had stood for less than 10 years and that it was likely that the settlements were short-lived, with reoccupation after a long period of time (Halliday, 2007). Clearly a substantial operational analysis of duration of occupation and residency is required.

Although Australia is usually considered to have been a continent of mobile hunter-gatherers before European contact, Hiscock discussed examples of claims for sedentism and increased sedentary behaviour in Australia, demonstrating some of the apparent fallacies involved in those claims. In the 1980s, Webb had proposed that high aggregation levels and a reduction of residential mobility along the central Murray River had led to higher numbers of parasites, leading to chronic anaemia and other disease patterns such as the *cribra orbitalia* lesions found in skeletal material from the area. Hiscock noted that these markers have since been shown not to be reliable markers of changes in population (Hiscock, 2008, 223-225). In a paper given at a conference in 2006, Robertson outlined studies conducted in populations along the Murray River to test North American models of association of *porotic hyperostosis* and *cribra orbitalia* with agriculture, aggregation and sedentism. Robertson reported that Australian populations showed a different lesion distribution pattern, suggesting a different aetiology. He also proposed that *cribra* was not a suitable indicator of aggregation and sedentism (S. Robertson, 2006).

When first observed by Western explorers, some groups in high rainfall north-eastern Queensland rainforest environments with abundant food resources constructed dome houses with wooden frames and organic coverings. These were often base camps, either seasonal, occupied for several weeks or months each year, or more permanent annual (or perennial) camps with fluctuating populations. There were villages with up to 20 shelters which were well-maintained through several years. Memmott wrote that 'sedentism was thus a response to high rainfall and an environment rich and diverse in food sources. Domes, in turn, were a response to the need for adopting a semi-sedentary lifestyle' (Memmott, 2007, 108). Suggestions have been made that as people in Australia became more tied to an area, with territorially closed social systems, they were in effect exhibiting 'sedentary' behaviour in a mobile society (e.g. Owen, 2010). Hiscock noted that some scholars had suggested there was intensification and a more complex social system in the late Holocene 'as a consequence of increased sedentism, inter-group competition and more rigid territorial boundaries', although these theories were not universally accepted (Hiscock, 2008, 258). Ambiguities expand as the issue of communities staying within one local region and moving from site to site has become conflated with the issue of permanent residence for many years continually in one settlement.

Hiscock noted that present-day scholars are concerned that the 19th century and later views of human societies evolving from 'simple' to 'complex' do not permeate more recent representations of prehistoric cultural change. He noted that several researchers

(such as Bowdler, McNiven, Tamisari and Wallace) had in the late 20th century used 19th century ethnographic records and historical depictions to deduce late Holocene sedentism in some parts of south-eastern Australia. Early historical accounts of huts in south-eastern Australia, together with remains such as clusters of earth mounds, had led some researchers to argue that Aboriginal people had lived in large sedentary village-like communities in the late Holocene, with populations up to several hundred people. Hiscock noted that the evidence for this was problematic, and cited Clarke's conclusion (Clarke, 1994) that the mythical cultural landscape of villages was not supported by archaeological evidence. He also noted that in Australia 'the hypothesized intensification of social life has proved difficult to measure' (Hiscock, 2008, 252-253, 265).

7.4 The 2010s

The moving of resources from uplands to lowlands was, according to Wengrow, a necessary factor in the transition from hunter-gatherer communities to early farming economies, in order to genetically isolate the earliest cultivated cereals and herd animals which were managed by human agency. They were taken from their original environment on hills and mountainsides to lowlands with oases, lakes and river fans and that was where agriculture was established. Wengrow noted that the spring at Jericho typified such restricted lowland environments, with a town of about three hectares established around 9,000 BC with monumental architecture and flood mitigation devices. Within a few hundred years, farming groups had taken over lowland niches around almost the whole of the Fertile Crescent. Their permanent settlements, with mud-brick architecture, developed into the artificial mounds of tells. By 8,500 BC groups were moving from the Turkish or Syrian coasts to eastern Cyprus, taking large fauna and cereal crops. Wengrow also commented that it appeared that hunters and foragers, rather than contemporary farmers, had created some of the earliest known monumental sculpture in the Near East (c. 9000 BC), such as at Gobekli Tepe. He noted that many innovations took place in specific social and environmental contexts, rather than following a constant progression of technological stages, before they spread through contact and exchange networks (Wengrow, 2010, 41-44).

In a chapter entitled "From Foraging to Farming and Pastoralism" in her work *The Ancient Indus: Urbanism, Economy, and* Society, Wright highlighted the fact that several thousand years of experimentation in the development of subsistence practices and settlement on the Indus plain had been necessary in order to sustain the large Indus civilisation under the prevailing environmental conditions. This experimentation included

the development of permanent villages and the domestication of plants and animals. Wright used the site of Mehrgarh as an example of the changes. Sedentary agriculturalists inhabited a village, initially 2-3 hectares in size, from 7,000 BC, developing to 12 hectares by 4,000 BC. Several plants were either domesticated there or imported from the Near East soon after habitation began, followed by the domestication of animals. Environmental conditions at the time were favourable. The most frequent of the initial dwellings consisted of four rooms, each measuring 5.5 x 3.7 metres, with entrances through the roof. Other dwellings had two, six or ten rooms. Technologies were developed and social changes took place, but Wright reported that it was considered likely that other communities in the area would have continued with a mobile hunter-gatherer lifestyle (Wright, 2010, 45, 54-57, 64).

Reviewing recent scholarship on the spread of agriculture in Neolithic western Europe, Rowley-Conwy (2011) posited that 'in most places, full sedentary agriculture was introduced very rapidly at the start of the Neolithic', in four major 'spread events', with almost no evidence of transitional economies. Sedentary communities and agriculture (which is mechanically "sedentary" in the sense that it remains indefinitely in one place) have been conflated. Rowley-Conwy argued that there were no long-term processes involved in the transition from foragers to farmers in western Europe. He noted that current genetic research supported a Near Eastern origin for many grains, ovicaprids and cattle, but that the population remained mainly indigenous with a small population of farmers immigrating with their domesticates (Rowley-Conwy, 2011). In contrast, Midgley posited that in northern Europe, the emergence of the Neolithic was a complex process. She wrote that the early farmers and late hunter-gatherers in northern Europe did not live in isolation, with material and cultural interchanges between the two groups (Midgley, 2011, 371).

Fletcher (1995) has emphasised the necessity for a community to have a system of communication which can cover the extent of a compact settlement before it can go through a sustained change in the nature of its residential pattern. Howery concurred with the necessity for a form of communication to effect a change in lifestyle, and posited that the development of a whistle enabled the transition from a nomadic lifestyle into the Neolithic era. He related this specifically to the Anatolian site of Gobekli Tepe and the Central North American sites associated with the Early Agate Basin Culture, c. 10,500 BC. Howery found modified granite stones which were able to produce a strong sound which travelled long distances in some Central North American sites located at the tops of ridges. He suggested that this would have allowed hunters to remain in one place for long

periods of time by coordinating their hunting, and thus have time to develop the Neolithic cultural traits and commence the domestication of plants and animals (Howery, 2011).

The simple unilinear evolutionary sequence of band to tribe to chiefdom to state proposed by the 19th century evolutionists was discussed by Read in *How Culture Makes Us Human: Primate Social Evolution and the Formation of Human Societies*. He noted that although their basic premises had long been discredited, they had 'correctly focused on evolution as directly related to the organization of human social systems, rather than as change emerging from the evolution of individual traits'. Read identified that the weakness of the evolutionists' arguments lay in considering those broad societal forms as single entities which were undergoing evolution rather than relating evolution to multiple modes of organisation which typify all societies. He noted that there was no law which made a band become a tribe, chiefdom or state, noting that Spencer had recognised this issue (Read, 2012, 31-32) even though much subsequent commentary, based on Spencer, seems not to have recognised this.

Recent research in the Jordanian Black Desert in the Late Neolithic period has changed views on settlement in the area. It was previously thought that nomadic and pastoralist groups had had temporary camps, with insubstantial structures. Rollefson reported that new evidence from surveys in the area suggests that there were larger settlements with up to 500 structures of basalt slabs, probably only inhabited during the winter and spring and early summer periods. The houses were around 5 metres in diameter, with roofs to about a metre above floor level (Rollefson, 2013), a further affirmation of Cribb's (1991) basic point that definitely mobile communities can use permanent settlements seasonally.

In 2012, Maher and colleagues reported results of excavations at the Early and Middle Epipalaeolithic site of Kharaneh IV in Eastern Jordan. They noted that results indicated that, contrary to general expectations of pre-Natufian sites as being campsites for small groups of seasonally mobile hunter-gatherers, 'some of these earlier sites were large aggregation base camps not unlike those of the Natufian'. Maher and colleagues studied the remains of two 20,000 year-old hut structures which showed evidence of repeated use over prolonged periods and which contained caches of objects such as shell, red ochre and burnt horn cores. They concluded that these Epipalaeolithic sites were important to the understanding of the development of sedentism and architecture, and that 'searching for the "first" huts, houses, sedentary sites or ritual behaviours, as we currently understand them, may be a futile enterprise', in part because of the time depth involved (Maher et al., 2012).

Recent excavations at Klimonas, a PPNA site on Cyprus, have revealed a village with stone artifacts and buildings similar to those in late PPNA sites in the Levant, dating to c. 8,800-8,600 BC. Vigne and colleagues reported that one circular building 10 m in diameter had been classified as a communal, possibly ceremonial, building, and was similar in layout and size to sunken buildings in the Northern Levant in the late PPNA. There were also several 4-5 m diameter rounded buildings adjacent to and above this communal building from different phases of the village's history. Vigne and colleagues commented that their excavations, together with those at Asprokremnos, had shown that people had been living villages in Cyprus in the first half of the 9th millenium BC. These communities had hunted wild boar and also cultivated plants (Vigne et al., 2012). This does not, of course, confirm that these communities were sedentary. It should also be noted that the use of terminology such as "village" leads to possibly invalid interpretations.

Excavations at Jebel Qattar 101, in the Nefud Desert in northern Saudi Arabia, have found lithics which appear to have links with the PPNA/PPNB cultures from the Levant. Jebel Qattar 101 is approximately 500 km from the core Levantine area, and Crassard and colleagues theorised that social and technological changes could have been brought to a peripheral settlement location by people migrating from the Levant or that there had been acculturation of the local mobile communities. They noted, however, that the particular site of Jebel Qattar 101 was more indicative of nomadic occupation than the contemporaneous sedentary sites in the Levant (Crassard et al., 2013).

Demonstrating the way that publications purporting to be about sedentism are sometimes more about mobility, Schmader and Graham (2015) published an article entitled 'Ethnoarchaeological observation and archaeological patterning: A processual approach to studying sedentism and space use in pitstructures from central New Mexico'. There is only one reference to sedentism in the actual text, which discussed Kent's (Kent, 1991) commentary on site formation and anticipated mobility. Schmader and Graham write that 'we offer a functional equivalent for site occupation by semi-nomadic, subsistence agriculturalists, which we will term "contingent sedentism"'. The major part of their paper is concerned with residential mobility or semi-nomadism (Schmader & Graham, 2015).

7.5 Conclusions

An increase in consideration of the residential status of prehistoric archaeological sites during these two and a half decades has been very apparent, although there is still no coherent argument, primarily because of the lack of definitional agreement and the use of "self-evident" logic. This is a curious situation, as the ambiguity is recognised and discussed. Lieberman has described sedentism as 'an elusive, if not tenuous, concept' (Lieberman, 1998, 75). Haiman noted that archaeological discussion of the terms sedentism and pastoralism was based on physical remains, rather than a study of the society itself, and if there is no physical evidence available the discussion is purely theoretical (Haiman, 1992, 94).

Discussion on the issues of sedentism was starting to change by the end of the 20th century and into the 21st century. Previous ideas that had generally been accepted had begun to be challenged and discarded. Partly answering the question in the title of his paper, 'What Makes the Neolithic So Special?', Dunbar wrote that, despite other innovations and inventions, including agriculture, the really important change had been the move from forager-type societies to settled ones. He noted that this had been 'radically under-appreciated in archaeology' (Dunbar, 2013, 25). In the early 21st century scholars were working to break down the traditional concepts of a "Neolithic package", particularly in relation to agriculture and sedentism. Byrd commented that many of the recent models of the transition from semi-sedentary hunter-gatherers to sedentary food producers had given less attention to the changes in social organisation which followed, instead focusing on the initial changes in subsistence and settlement patterns (Byrd, 2005a, 1-4). There were actually no known unequivocal examples of the change from relatively residentially organised settlement systems to logistically organised ones, which Byrd posited would have been necessary for communities to become sedentary in the PPNB period in the Levant (Byrd, 1992). Domestication did not happen at a uniform rate across different regions. Hey, Mulville & Robinson (2003, 97) demonstrated that the linking of agriculture and sedentism is not self-evident, particularly in the Middle Neolithic to the Early bronze Age in the UK. The earliest farming communities in Upper Egypt and the Sudan had had little permanent architecture or signs of village-based existence (Wengrow, 2006).

Scholarship is starting to demonstrate that "sedentism" was not what previous generations had assumed it to be. Analytic technology has been playing a larger part in archaeological research since the 1960s and 1970s, giving a more scientific basis to some of the assessments of residential status. However, the self-evidence and even unilinear

stage models continue to pervade archaeological thought and there is still considerable ambiguity and conflation of issues. As more is written on the subject without an agreed definition of the terminology being used or a consistent theory underlying the scholarship, this has led to greater ambiguity than there was in earlier periods. This issue is something that does not, with notable exceptions, appear to be widely recognised. The problem is pointed out periodically, but does not register in the practise of the discipline. A core problem seems to be that the metalogic of the debate has yet to become a topic of discussion in its own right, which is crucial to its resolution.

PART III – INTERPRETATIONS, ISSUES AND DISCUSSION

Chapter 8: Discussion: Logical and analytic issues and problems

'exploring the topic of Neolithic social organization is like juggling a porcupine – whatever way you throw it up, it comes down prickly' (Kuijt, 2000a, 265)

8.1 Introduction

Three major quandaries hinder the understanding and analysis of the "settling down" process – the initial changes of human lifestyle from one which was essentially mobile to one which was essentially sedentary. The first of these is the problem of "stage" notions, inherited primarily from the 18th and 19th century philosophers, who based their theories on second- and third-hand accounts of conditions in newly discovered parts of the world, leading to conjecture which tended to become considered as established "fact". The stage theory approach has contributed to the current ambiguity and confusion in the study of sedentism and sedentising, epitomised by efforts to characterise the complex hunter-gatherers as "sedentary". The second is the conflation of the origins of agriculture and the transition from mobility to sedentism, and the way that discussion of domestication has, in many cases, pre-empted discussion of the transition to sedentism. The third is the issue of whether there are secure material markers for sedentism in the archaeological record. These quandaries are, of course, compounded by the lack of agreed definition of what sedentism actually was at the time of the prehistoric transitions.

The transitions to sedentism were a major behavioural change, possibly the greatest single change in human community life. Today, a significant proportion of humankind is considered to be sedentary. Prior to 10,000 years ago, *Homo sapiens sapiens* had, as far as we can judge, lived for more than a hundred thousand years with differing degrees of residential mobility. There is no dispute that there was a transition in modes of living which took place in many separate regions of the world between 15,000 and 5,000 years ago, as discussed in Chapter 1. Although in the majority of cases this may have been a move to sedentism, it was not necessarily always so, and current interpretation of the archaeological record does not allow for fine-grained identification of occupation durations. Moreover, defining archaeological sites as the location of former sedentary communities remains problematic – there is a lack of evidential and classificatory rigour. Furthermore, there are some substantial logical interpretative consequences related to

classifying communities as sedentary which were actually not sedentary, or vice versa – claims that sedentism can occur without agriculture being a key example. In addition, because transitions to sedentism must have happened in so many different parts of the world it cannot be sufficiently considered or theorised on a local or regional basis using unique contextual criteria. A global explanation is required, albeit one which allows for local variations. The analysis of sedentism and sedentising therefore requires regional and multi-period cross-comparison, which adds its own problems.

As discussed throughout the thesis, becoming sedentary and therefore changing ways of living that had existed for millennia has been considered by many scholars as an obvious and inevitable "progression" for humans, and there is still, somewhat curiously, little systematic and cross-cultural consideration given to the overall processes or the timespans involved in that change. But it was actually a surprising and anomalous change, and the transition from mobile lifestyles to sedentary ones would, it appears, have taken place within a relatively short timeframe in many different regions of the world – with, as yet, no agreed explanation for the change. The phenomenon therefore needs to be systematically theorised, precisely because it was so unusual and has had such a profound impact on the way that humans live today. In essence, no coherent global theory exists because no coherent, agreed, theorised definition exists and an operational understanding of sedentism is lacking. Nor is there a biological model or a theory in another field or discipline which could assist by providing a proxy model that could be applied to this initial transition to sedentism. The old anthropological models, with their Western assumptions about property, economics and progress based on unilinear stage theory do not cover the wide range of behaviours involved in the changes and are not universally applicable.

The focus on the factors involved in, and the processes leading to, the initial transitions from mobile lifestyles to fully sedentary ones in different areas of the world has been derailed by many factors. The main problematic issues concerning the nature, identification and analysis of sedentism relate to several scholarly procedures. The first is the tendency to conflate a move to sedentism with other and different debates, such as the origins of agriculture and domestication, whether agriculture preceded sedentism or vice versa. The second is the paradoxical interpretative conclusions that derive from the inconsistent designation of societies as sedentary, as is illustrated by the problems that arise from the issue of defining various complex hunter-gatherer communities as either sedentary or not sedentary. The third is the logical confusions that follow from the key fallacies relating to how we envisage, perceive and index sedentism and mobility, such as the issue of material markers for sedentism. What this assessment indicates is that the

difficulties which are encountered derive from analytic and interpretative procedures which are fundamental to archaeology, as outlined in Chapter 2. The overview of the history of opinions on the transition to sedentism demonstrates that there are some deep logical problems and inherent ambiguities which need to be resolved. The problem is severe. Stage theory, determinism and ethnographic analogy remain largely entangled with one another, though they are gradually, but as yet only partially, being decoupled. They are also mixed up with contextually unique interpretative positions which deal with each region and culture as a bounded entity without reference to the phenomena, processes and trajectories occurring in other regions.

8.2 Labels and Inconsistencies

As is apparent, there is no agreement between the stances taken by different scholars on the subject of sedentism and sedentising, particularly in relation to the terminology which is being applied. As Agger noted, Derrida has posited that 'language, including writing, is a muddy, ambiguous medium that necessarily defers clear understandings indefinitely' (Agger, 1998, 37). Recognising the form of the muddy ambiguous medium, and then clarifying it, will be necessary in order for scholars to coherently study what constitutes sedentism.

Some consideration of the lifestyles of pastoralists is needed, in order to assist in the understanding of hunter-gatherers. In their introduction to *Pastoralism in the Levant*, Bar-Yosef and Khazanov wrote that they had pointed out to the authors that it was necessary to develop and elaborate on a commonly accepted terminology in order to facilitate communication. They noted that no-one had disputed that aim, but that as editors they had not had great success in attempting to unify the terminology. Bar-Yosef and Khazanov concluded that 'few scholars are willing to change their use of terminology which, either from practice or preference, they consider correct' (Bar-Yosef & Khazanov, 1992, 2).

In 2008, The German Archaeological Institute hosted a conference entitled 'Sedentism: Worldwide research perspectives for the shift of human societies from mobile to settled ways of life'. Gebel begins the abstract for his yet to be published paper from this conference, entitled 'Territoriality in early Near Eastern sedentism', with the words:

> 'From its beginnings, the sedentism debate has suffered from a lack of definition frameworks and has been characterized by many ingredients of seminal world perceptions of individual scholars. Everywhere sedentism concepts failed to work

> when applied to understanding the supra-regional trajectories or specific regional mixtures of biotic, abiotic, and cognitive resources and their related socio-economic evolutions and devolutions' (Gebel, In Press)

The pragmatic implications of the vagueness are serious. Kotsakis pointed out, in relation to the Neolithic of Greece, 'we know so little about the earliest Neolithic agriculture that using it to define the Neolithic is a purely verbal exercise'. He suggested that the same was true for understanding of mobility and the way in which some of the early farming groups used logistical mobility, at least in part. Kotsakis proposed that the period should be reappraised, with traditional models being replaced by more fluid concepts of the lifestyles of forager/hunter-gatherers and farmers (Kotsakis, 2005, 12-13).

What is now clear is that the conventional associations, such as of agriculture and settlement, cannot be assumed. Empirical analysis of early agricultural communities, such as in the Neolithic of the British Isles, has begun to decouple agriculture from the cultural behaviour of sedentism and open up a path to a radical redefinition of the varied trajectories of social life. Sedentism is, therefore, part of a larger debate about the relationships between the material components of society, economics and residential behaviour.

In the preface to *Archaeology and Ethnoarchaeology of Mobility* the editors noted that although mobility strategies are usually regarded as more relevant to studies of hunter-gatherers, mobility strategies are also important elements of more sedentary adaptations. They continue by stating that:

> 'in the simplest terms, decisions regarding mobility affect many aspects of social organization, population distribution, and subsistence strategies. This in itself makes it an important area of anthropological research' (Sellet, Greaves, & Yu, 2006, xiii).

In the introduction to the book *Seasonality and Sedentism: Archaeological Perspectives from Old and New World* Sites, Bar-Yosef and Rocek pointed out that every society uses a territorial range, and stated 'in fact, the concept of sedentary, permanent settlement is only a matter of definition, in the prehistoric past as well as now'. They continued, positing that it had become clear that it is fruitless to attempt to divide societies into discrete categories of mobile and sedentary, because all societies have a component of mobility. Bar-Yosef and Rocek wrote that what was important was the form of that mobility, not whether it had existed. They posited that analysis of mobility is a critical variable in the study of any society, rather than being restricted to nomadic or hunter-gatherer societies (Bar-Yosef & Rocek, 1998, 1). Mobility does need to be rethought, as

the mobility of people in an industrial city is, in some very crucial ways, not the same as mobility in a !Kung bushman community.

The issues of definition extend beyond the problem of "what is sedentism", and suggest that a suite of redefinition and reappraisal is needed. One of the ambiguities that has persisted, for example, is the use of the term "pastoral nomadism". Not only is there some ambiguity in the application of the term, but also in the way that such communities have been considered in scholarship. Pastoral nomads do not fit into the conventional unilinear stage theory concepts, and thus are sometimes treated as anomalous, rather than as a way of living in its own right. There are various classificatory positions. Steven Rosen noted that what he termed 'the inherent adaptive resilience of pastoral nomadic societies' had long been considered as one of their primary attributes, but it had been studied only in the short-term ethnographic present. Many historical interpretations have been based on short-term perspectives, which has led to an incomplete understanding of the actual history of nomadic societies. Rosen went on to comment that a longer-term perspective, based on archaeological studies such as those in the Negev and surrounding regions, indicated that some basic assumptions concerning these groups are flawed. He suggested that re-evaluating the development of these societies showed an evolution which was as complex as that of sedentary communities (S. A. Rosen, 2008, 115). Rosen had previously commented that the basic premise of archaeological research on the origins of pastoral nomadism in the Near East had centred on their economic dependence on domesticated animals. However, ethnographic research had demonstrated that pastoral nomadic societies have a multiple resource-based economy. Rosen divided the developmental sequence for the southern Levantine pastoral nomadic systems into four stages – a hunter-gatherer stage, a herder-gatherer stage (with domesticates adopted into peripheral systems), an early pre-camel stage and a final stage with the adoption of the camel, with the first three stages from 8,200 BC to 2,000 BC and the fourth starting at the end of the 2nd millennium BC or later (S. A. Rosen, 2002, 23-24).

Pastoral nomads are sometimes considered as unstable because they are frequently moving around. Wendrich and Barnard point out that although traces of the movement of nomadic communities across the landscape can be ephemeral, they do exist (Wendrich & Barnard, 2008, 1). Some pastoral nomads even constructed towns, such as the Mongol city of Sarai at the mouth of the Volga (Halperin, 2002). More recent research relating to pastoral nomadism has generally been separate from research on sedentism, and the relationship of pastoral nomadism to initial sedentism is an avenue that needs further exploration and clarification. Given the definitional and analytic problems associated with both of these categories, they perhaps need to be rethought together.

Marshall noted that Binford's much-cited paper *Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation* (Binford, 1980), with its distinction between logistical and residential mobility and between foragers and collectors, has remained important in the evaluation of sedentism. She suggested that its concepts have endured because Binford did not start with the assumption that sedentism was an on/off switch, or something a society had or did not have. Marshall suggested that 'sedentism should be measured in degrees and qualities, not by presence or absence' (Marshall, 2006, 158). Although such considerations would clarify some of the ambiguity, they would still not actually help to define what the phenomenon which scholars are referring to as "sedentism" actually is. That there is some distinct phenomenon concealed under the label is indicated both by the settlement growth rates of the past 10,000 years and by the "self-evident" nature of settlements with residential communities which stay in one place for centuries. There is also a need to allow for the many gradations that existed in mobile communities.

Since the 19th century, the ongoing, pragmatic, perhaps tacit and often not articulated acceptance of the basic concepts of stage theory as a means to order archaeological data has continued to obscure the processes involved in the transition from a mobile lifestyle to a sedentary one, and in some cases the reversion from a sedentary lifestyle back to a more mobile one. The old unidirectional viewpoint has, for example, tended to lead some scholars to regard what they describe as complex hunter-gatherer societies as being on a path to something else, to a more "advanced" and "civilised" state – and a substantially "sedentary" condition, rather than studying them as they were, essentially communities of hunter-gatherers, who were using varied and different residential patterns and modes of mobility and economic strategies. Terms such as "semi-sedentary" derive from this premise of graduated change.

8.3 Complexity and Hunter-Gatherers

One element of the debate regarding sedentism involves cross-comparison with the complex hunter-gatherers who feature in a variety of the models. The problem is that the nature of their residential patterns is not agreed except, in some cases, at a local or regional level where unique local designations are being applied. As with so many of the topics related to residential and economic status in the past, there is ambiguity in the meanings ascribed to the term 'complex hunter-gatherers', and there is no agreed definition of what actually comprises complexity. Price wrote 'there seem to be as many

definitions of complexity as there are archaeologists interested in the subject' (Price, 1995, 140). There is some overlap in the interpretations of sites of complex hunter-gatherers, and the way in which some complex hunter-gatherers have been misdefined as sedentary. More recent dating techniques, with consequential redating of some sites, have led to more descriptions of 'sedentary hunter-gatherers', with concomitant assumptions of different behavioural patterns. Some scholars are beginning to look at hunter-gatherer data and beginning to have concerns about aspects of its interpretation, and it is becoming apparent that sedentism is not actually what people previously thought it was.

Many different definitions of "complexity" have been provided. In 1985, Price & Brown wrote that what was important was a recognition of the diversity in prehistoric hunter-gatherer groups, rather than a precise vocabulary to describe what was meant by complex. They went on to note that 'we follow a general definition of cultural complexity that focuses on increases in societal size, scale, and organization'. They nominated in quite general terms some characteristics of increasing complexity:

> 'Intensification has been discussed in terms of a variety of factors: environment, resource availability, subsistence, sedentism, linear settlement, technology, storage, population, exchange, conflict, competition, social organization, territoriality, style, labor organization, craft specialization, inequality, and status differentiation. There are, however, few studies that distinguish among (1) the conditions that foster affluent foraging, (2) the consequences of this process, and (3) the causes of intensification' (Price & Brown, 1985, 3, 7-8) .

Habu and colleagues point out that some scholars, such as Jeanne Arnold, use more restricted definitions (Habu, Savelle, Koyama, & Hongo, 2003, 3). Arnold defined complex societies as having the basic characteristics of being organisational, 'distinguishing those societies possessing social and labor relationships in which leaders have sustained or on-demand control over nonkin labor and social differentiation is hereditary' (J. E. Arnold, 1996a, 78). The imprecise use of the term "intensification", particularly in relation to hunter-gatherers, has, according to Morgan, confounded problems relating to conditions which increase (or decrease) agricultural productivity. Despite considerable scholarship reconstructing past economies, particularly focusing on the Broad Spectrum Revolution, there is still doubt as to whether increased diet breadth and sedentism represented intensification at the beginning of the Holocene (C. Morgan, 2015, 163, 167), or if they were associated with the development of agriculture (Zeder, 2012, 259).

Nelson defined complexity in archaeological practice in relation to Mesoamerica and the American Southwest as:

> 'a web of properties whose interrelationships are poorly understood. Social systems are considered complex if they are comparatively large demographically and spatially, encompass multiple settlements in an integrated political structure and exhibit horizontal and vertical social differentiation. Other properties associated with complexity are hereditary ranking, production of surplus and its appropriation by an elite, craft specialization, and long-distance exchange' (B. A. Nelson, 1995, 588)

However, this may be an overly elaborate definition for hunter-gatherer communities at the time of a transition to sedentism in the Old World. Chapman does not give detailed consideration to the issue of societies becoming or being sedentary in his book *Archaeologies of Complexity*. There are merely occasional references to topics such as complex hunter-gatherer societies and settlements with short-lived durations (Chapman, 2003, e.g. 85-87, 122, 190-191).

Matson wrote in 1985 that although not all ethnographically known sedentary hunter-gatherer communities display status inequalities, those which have ascribed status positions 'are noticeably more sedentary than most hunters and gatherers'. He went on to posit that in human prehistory, hunter-gatherers who were mobile and egalitarian had evolved to societies of sedentary agriculturalists with definite status inequalities, and that some aspects of this had actually happened before the development of agriculture. Matson theorised that 'the development of sedentism and status inequalities may both be necessary pre-requisites for the development of agriculture'. Matson defined a sedentary society as 'one in which a single settlement is occupied for a substantial portion of the year and is regularly reoccupied'. Because it was likely that such communities would be relatively stable in their membership compared with mobile hunter-gatherer societies, Matson continued his definition, stating 'sedentariness, then, is a relative concept not an absolute one, but an important concept that refers to a notable change in society' (Matson, 1985, 245-246). The problem is that this designation could equally describe mobility and other concepts as well.

In 2000, Hallan Çemi was considered to be the oldest known fully settled village in eastern Anatolia, which Rosenberg and Redding described as 'the remains of an essentially sedentary hunter-gatherer society, albeit one on the threshold of animal domestication'. They noted that the community had engaged in recurrent feasting as a way of establishing co-operative relationships in a highly competitive environment. Despite its small size and proto-Neolithic economy, there was evidence of the beginnings

of the kind of organisational characteristics of later, fully developed Neolithic societies of the area. Rosenberg and Redding theorised that this meant that:

> 'the basic structure of Neolithic societies emerged during the very earliest stages of the trend toward the development of food producing economies (i.e. with sedentism), not differentially in tandem with a growing dependence on food production'.

They posited that these organisational features were necessary for a sedentary lifestyle, irrespective of its subsistence base (Rosenberg & Redding, 2000, 40-41).

There is also a tendency to regard complex hunter-gatherer societies as on the continuum towards a more "advanced" state, rather than remaining in their current condition or moving towards a completely different direction. There are multiple possible trajectories that these societies could have taken. Kelly highlighted the fact that sedentism is likely to place constraints on mobile hunter-gatherer lifestyles, rather than lift them. He theorised that sedentism is more likely to occur when local resource failure restricts mobility and the sedentary hunter-gatherers have to use other means to reduce the risk from reliance on a single resource or location (Kelly, 1992, 58).

8.4 Case Studies:

Communities of complex hunter-gatherers that do not fit the expectations of the current "self-evident" models of sedentary communities include the Calusa of Florida, the populations of the Natufian and Jomon periods and the North-West Coast Indian populations. There has been considerable research on these communities in recent years, and the significance of gaining greater understanding of their lifestyles has come to be recognised. In the mid twentieth century, for example, scholars assumed that the people who used the Natufian cultural assemblage in the Levant were sedentary (e.g. J. G. D. Clark, 1961a; Moscati, 1956). As Shewan pointed out, however, residential stability in the Natufian period needs to be carefully reconsidered, because it is 'fundamental to any discussion of the origins of food production and its relationship to sedentism'. She posited that Natufian period settlement systems and adaptive strategies were not consistent and that one of the strategies 'could have been an eventual basis for sedentism' (Shewan, 2004, 55). Shewan demonstrated the magnitude of the issue, using strontium isotope analysis which showed that human populations had actually been as mobile as gazelles and carnivores in the areas of the Levant which she studied (Shewan, 2003). Similarly with the Jomon period, it is only recently that scholars such as Habu have demonstrated that the earlier assumptions about sedentary villages of hunter-gatherer

communities were not in accord with the archaeological evidence (Habu, 1996 and others).

The Calusa: The Calusa Indians of Southwest Florida provide an illustration of the problem. They no longer existed as a coherent social community by 1750 AD, and although there are several contemporary reports from Spanish travellers (see Ferdinando, 2010; Worth, 1995) there is thus no reliable ethnography on which to assess their lifestyles. They are assumed to have been sedentary, partly because they built large thatched communal houses, possibly on mounds. One such structure was described in 1566 as having been 'large enough for 2,000 to stand within without being very crowded'. Marquandt estimated that if the figure of 2,000 was not an exaggeration the structure would have been about 625 square metres, but large buildings do not definitively indicate enduring sedentism. They did not apparently practice agriculture, although they used plants for food, medicine and fuel, and lived in a very resource-rich estuarine environment (Marquardt, 2004, 207). Scarry and Newsom pointed out that assessments of their subsistence economy were based on limited evidence, mainly from ethnohistoric reports, which did not mention domesticated crops (Scarry & Newsom, 1992, 375).

One reason for the assumption that they were sedentary may be that no-one actually reported that they were not. The Spanish thought they were, apparently because they had big chiefs and because of the "self-evidence" of the large structures they constructed. However, large buildings and durable residences do not indicate that sedentism has been demonstrated. Estimates of the Calusa population in the 16th and 17th Centuries vary considerably, from 97,600 down to as low as 4,000 people, with several estimates in the 10,000-20,000 range (Hann, 2003, 54-55). Herando D'Escalante Fontaneda was shipwrecked and captured by the Calusa in 1549/1550 and lived with them for 17 years. He described many different villages and towns, perhaps because he was moving with the local population (Fontaneda, 1575). One reason population estimates vary so much could be because the communities were in fact moving in and out of the villages, and the same people may have been counted more than once or not at all.

If the Calusa are classified as having been sedentary, then it would demonstrate that non-agricultural people can be sedentary. It also would show that if nutritional resources are available all year round in one area, that would allow or cause sedentism, and that states and chiefs can develop in sedentary, but non-agricultural, communities. These consequences have profound implications for major theories about human community life and its transformations. However, if the Calusa were not sedentary, then none of these scenarios is valid.

The North-West Coast Indians: In recent publications, Moss and others have reclassified the North-West Coast people as fishers and food-producers, rather than hunter-gatherers, based on the fact that on average 85% of the faunal remains from their sites were fish bones. Moss also argued that cultural complexity began about 12,000 years ago in this area, where communities utilised resources to enhance the biological productivity of the region (Moss, 2011). At the time of contact with Westerners, the North-West Coast Indians lived in villages with large and substantial buildings, which were occupied seasonally. Many scholars have regarded them as being sedentary because of the substantial nature of the houses and villages. However, in 19th century America, the popular stories of J. R. Jewitt's confinement by the Indian inhabitants of Nootka Sound, on the West Coast of Vancouver Island, lead to a very different assesment. Jewitt recounted that on 3rd September 1803 the whole tribe, taking him and his fellow captive with them, left Nootka 'according to their constant practice', in order to spend the autumn and part of the winter at Tashees (about 15 miles from Nootka) and the balance of the winter at Cooptee (about 30 miles from Nootka) before returning to Nootka. Jewitt reported that they took everything with them in their canoes to their next location, including their house planks (Alsop, 1815, 84, 100). Jewitt was acutely aware of their mobility, as he realised he could only be rescued when the community was in their coastal village and passing ships might see him on the beach.

Reconstruction of the seasonal rounds of the inland Dena'ina, living in a transitional area in Alaska between boreal forests, coastal tundra and the maritime coast, between 1890 and 1987 showed that they 'hunted, fished, trapped, and gathered from a quasi-permanent community base'. However, Ellana reported that for the majority of the year they moved from a series of seasonal subsistence camps spread over the resource territory rather than living in the village. She noted that 'most middle aged or older Nondalton residents remember making an average of 11 moves a year, from one seasonal camp to another or to the village, during some period of their lifetimes'. Nevertheless, the villages were considered important in providing social and political continuity (Ellana, 1990, 104-105).

In 2011 Cannon wrote that there was 'clear evidence of sedentary settlement and a storage-based subsistence economy' at Namu, in British Columbia, from at least 5,000-500 BC, despite low population levels, noting that the place had physical advantages for residence. He went on to describe Namu as a 'permanent winter village with year-round occupation by at least some portion of the community' by 5,000 BC, thus rendering it 'a permanent, and by any reasonable definition, an essential sedentary village settlement', albeit an anomalous one. Cannon's explanation for the maintenance of the settlement at

Namu was that it had a ritually based system of seasonal activity, with the winter village being ‘a place of ritual permanence’. He also noted that the population had not grown over time, despite the fact that there was economic potential for it to have done so (Cannon, 2011, 54-59, 65).

The point is not that they were, or were not, sedentary, but the need to resolve the classifications. Otherwise, diametrically opposite conclusions follow from exactly the same data and social examples concerning a very concrete and real issue. The characterising of the North-West Coast Indians at the time of Western contact as sedentary is clearly problematic, and highlights an important issue. If the North–West Coast Indians, some communities moving at least twice a year, are described as ‘sedentary’, then communities so labelled can, and possibly should, more accurately, also be described as ‘mobile’. If they are considered to be sedentary, then the term has little meaning, and almost any community could be considered sedentary using the definition “is considered to have big buildings and come back repeatedly to one place”.

The Natufian culture: There has been considerable scholarship and discussion on the subject of the Late Epipalaeolithic Natufian culture in the Levant (c. 10,800-8,500 BC) and whether its population was sedentary, had seasonal occupations or episodic occupations of sites and whether or not it was an example of a sedentary hunter-gatherer society. Finlayson and colleagues wrote in 2011 that there was a ‘general consensus’ that the Early Natufian period people had led a sedentary way of life, but questions were being asked about the degree of sedentism (Finlayson et al., 2011, 8183). But it is equally a question about degrees of mobility. Boyd did attribute some of the uncertainty to definitions of sedentism, and suggested that ‘interpretations of the archaeological evidence are being hampered by the continued adherence to “sedentism” as a concept for explaining social transformations in settlement and landscape’ (Boyd, 2006, 164). Shewan’s comparative study of strontium isotope ratios in fossil fauna and archaeological human skeletal tissue from Natufian sites showed ‘a pattern consistent with regionalism and the localized procurement of food resources’, and her results demonstrated that the sites she studied could not securely be said to have been occupied year-round (Shewan, 2004, 55).

The Neolithic period in the Levant has been described by Neeley and Peterson as ‘a turning point in the relationships between human groups and their natural and social environment’. In discussing a cluster of ten Natufian sites in the Wadi Juhayra, Neeley and Peterson noted that the density of those sites was unusual for the period, and that stone tools and debris ‘suggested a relatively intense level of prehistoric activity’. They

also noted that the ground stone tools from the Wadi Juhayra sites and from Kirbat al-Hamman suggested that plant food processing was an important activity and that dietary mainstays for both the Natufian and Neolithic communities would have been cereal grasses and tuberous starchy bulbs. Neeley and Peterson's research is ongoing, but they wrote that 'west-central Jordan is a productive setting for assessing and understanding the transition from hunting and gathering to farming' (Neeley & Peterson, 2007).

Edwards noted that 'the precise ordering of Natufian sites was of prime importance in tracing human steps towards sedentism and early food production'. He noted that recent revisions of chronologies of sites 'did not reveal the Natufian growing inexorably, nor transmuting smoothly into the earliest Neolithic'. Instead, there appeared to have been a lessening of sedentism and the abandonment of many sites in the later part of the Natufian period. Edwards wrote that reassessment of archaeological data has attempted to provide definitive behavioural correlates, but 'sedentary, semi-sedentary and transhumant residential strategies converge too closely for a clear solution to have emerged'. He posited that it was most likely that the Natufian communities left the larger settlements on a regular basis to pursue local food resources. Reassessment of archaeological material from Wadi Hammeh 27 had shown evidence of a 'pre-agrarian, semi-sedentary settlement'. (Edwards, 2012, 5-6, 15, 389). Edwards noted that the open-air base camps which were established in the Early Natufian period were regarded as 'a key juncture in the evolution of human residential strategies, not only in the Levant but also on a global scale'. These had developed during the favourable climatic conditions of the Bølling-Allerød stage. There were few of such open-air base camps known, and Edwards questioned why, if they had triggered the beginnings of village sedentism, such "village" settlement had taken so long to appear (Edwards, 2012, 390).

Hardy-Smith and Edwards noted that despite the ambiguity about residential strategies in the period, there was consensus that there had been longer residential occupancies than in previous periods, and some Natufian settlement models had been developed with elements of sedentism, transhumance and mobility. The main theme of these models involved 'long, wet-season (winter) base-camp occupation followed by dry-season abandonment of the home base in favor of short or long-range foraging, whether this be in a circulating or radiating fashion'. Other models suggested the larger Natufian sites were sedentary base-camps from which people spread out in a radiating fashion seeking food and resources. Hardy-Smith and Edwards also noted that it was possible to identify, archaeologically, how much community energy had been invested in the large Natufian sites, with stratigraphic evidence for repeated occupations, architectural units maintained for long periods, elaborate burials, abundant and varied artefact assemblages including art

and symbolic objects and the stockpiling of heavy tools (Hardy-Smith & Edwards, 2004, 257-258). These do not, of course, in themselves demonstrate the existence of sedentism (see Edwards, 1987, also Fletcher, 1995).

As an example of changing viewpoints, Hardy-Smith and Edwards used data on refuse disposal from the Natufian period site of Wadi Hammeh 27 in Jordan, dated to c. 10,000 BC, and compared it with earlier and later sites from c. 18,000 to 6,000 years BC. From this they concluded that Natufian period communities had not developed their refuse disposal practices enough to sustain sedentary living on a long-term basis. They noted that refuse disposal only began in the later, Pre-Pottery Neolithic A time, c. 8,300-7,200 BC, and was not standard until the Pre-Pottery Neolithic B time, c. 7,200-6,000 BC. Hardy-Smith and Edwards also noted that studies of agriculturalists, both sedentary and semi-sedentary, had shown that the use of secondary refuse dumps had increased as the duration of residence increased (Hardy-Smith & Edwards, 2004).

The traditional division of the Natufian period based on the spatial distribution of sites and archaeological record variation, with the division coinciding with the onset of the Younger Dryas, was considered by Neeley and Peterson. They wrote that the Early Natufian (c. 10,500-9,000 BC), with sites typically in Mediterranean environments, had evidence of a more diverse material culture 'and evidence for a more sedentary lifestyle'. The Late Natufian settlements, mainly in more marginal environmental zones, 'tend to reflect a more mobile lifestyle'. They also wrote that the PPNC and early Pottery Neolithic were characterised by increased mobility and a growing reliance on pastoralism (Neeley & Peterson, 2007, 206-207).

In 1989, Belfer-Cohen had described the Natufian as the first prehistoric entity in the Levant with evidence of intensive building activities, with the sizes of the Natufian sites heralding the compounds and villages of the later Neolithic cultures. She noted that there was at that time continuing debate on the Natufian subsistence strategies, ranging from a continuation of the economy of its Epipalaeolithic predecessors to agriculturalists who continued to hunt and trap animals. Belfer-Cohen noted that in fact by 1989 it had been demonstrated that domesticated crops were not evident in Natufian sites (Belfer-Cohen, 1989, 298-299). In 2000, Belfer-Cohen and Bar-Yosef described the Natufian period as 'bridging two different ways of life: the first (hunting-gathering) ... is now replaced by the second (agriculture)'. They went on to describe the Natufian period as being 'identified with the transformation from mostly mobile foraging to mostly sedentary agricultural cultivation, domestication of plants and animals, and herding'. They noted that this was the first archaeological entity with substantial architectural remains and large burial

places, and with large base camps and small ephemeral campsites (Belfer-Cohen & Bar-Yosef, 2000, 21-23). But these phenomena would only indicate a path to sedentism when interpreted in a progressive stage model. Yet Neeley and Peterson, for example, have shown that the Late Natufian was essentially mobile (Neeley & Peterson, 2007).

Belfer-Cohen and Bar-Yosef also noted that many scholars proposed that the Natufian culture should be subdivided according to environmental settings and modes of adaptation, which would provide information on the links between the Natufian social structure and the emergence of sedentism. They qualified their comments with the warning that complex hunter-gatherer societies, including the Natufian, were not stable social units (Belfer-Cohen & Bar-Yosef, 2000, 21-23). Belfer Cohen and Bar-Yosef posited that not all the Natufian communities had been able to move to the stage of sedentism and food production. They based this on the change in settlement patterns from the Late Natufian to the PPNA period. The known larger Natufian sites had all been located along the Western ecotones, whereas the larger known PPNA sites were located in the Jordan Valley and the smaller ones on its western flanks (Belfer-Cohen & Bar-Yosef, 2000, 30). The central issue is whether the PPNA is on a path to a sedentary PPNB or is a separate path to something else. Only a model of a single trajectory of settlement growth leads to such an ordering. An alternative, which shows that the linear convention cannot be regarded as secure, such as Fletcher's 1995 plural path model, with a trajectory towards complex hunter-gatherers using mobile economies and another trajectory towards long-term sedentary communities supported by agriculture.

The Jomon culture: Much has been written recently on the subject of social complexity and its relationship to sedentism during the different phases of the Jomon period. The Jomon culture in Japan (c. 14,500-300 BC) constructed some large villages (Sannai Maruyama, for example, covered more than 35 hectares) with sizable structures, as well as smaller village-style settlements, many of which had a distinctive 'horseshoe' shape. They trapped animals in pits and fish in weirs. They made heavy, decorated pottery, invented lacquer, used specialised production techniques and had extensive storage facilities, although they apparently only practised very limited horticulture. These characteristics had led many scholars to assume that the Jomon were a permanently settled hunter-gatherer population, at least from the Middle Jomon period, c. 3000-2000 BC onwards. This assumption is now being questioned by some scholars (e.g. Habu, Imamura, Keally, Takahashi, Tamaguchi and many others). Other scholars (e.g. Pearson, Kobayashi and others) continue to accept the sedentary hypothesis. As an example of the change in thinking, Habu's study of sedentism and inter-site variability in the Early Morioso phase of the Jomon period in Japan (c. 3,900 BC) demonstrated that the lithic

assemblages and site sizes of the hunter-gatherer communities in two sub-phases in the Chubu and Kanto regions were similar to those of collectors with seasonal moves, whereas the settlement patterns of the third sub-phase represented a forager system. Her study also indicated that the Morioso-phase people were not fully sedentary (Habu, 2004, 89-108).

Demonstrating a different view, Pearson wrote in 2007 that in recent years, earlier dates for the beginning of sedentism in Japan had been established, with Imamura placing the beginning of pottery and sedentary life at about 13,500 BC (calibrated). He also noted that many Japanese archaeologists considered both aspects of Kelly's (1992) push/pull hypothesis for groups settling down, with the "pull" of the abundance of nut-bearing trees post-Pleistocene and the "push" of the disappearance of large game animals at the end of the Pleistocene. Pearson acknowledged that 'sedentism is a complex process rather than a threshold and that increased site size, the presence of houses, and dense concentration of artifacts may be the result of reoccupation or repeated use of special purpose sites'. He noted that some sites in southern Kyushu showed signs of sedentism at dates which were roughly comparable to the time of increased sedentism in the Pre-Pottery Neolithic of the Levant, 9,700-6,250 cal. BC (Pearson, 2007, 361-363).

Kaner noted that Jomon societies have been considered as exemplars of complex hunter-gatherers, and used residential movements as a framework for understanding some of the social processes in those societies to aid in the discussion on whether Jomon societies were stratified or egalitarian. He posited that some of the behavioural characteristics associated with sedentism such as 'relatively stable, long-term, organised settlements with fixed facilities' existed early in the Jomon sequence, but some changes 'do not support unilineal interpretations' (Kaner, 2011, 183, 201).

These cases of the Jomon and the Natufian lead to the important, and as yet unanswered, question of how long a community needs to have remained in one location in order to be considered as sedentary, or having residential stability. As noted in chapter 2, there is still no agreement on this. The labelling of a community in a particular way can cause contradictions in the interpretation of lifestyles, especially in cross-cultural comparisons and with correlations, such as to whether or not a given economy is connected to sedentism or mobility.

8.5 The Sedentism-Agriculture Problem

In 1992 Hard & Merrill stated that, despite the correlation between agricultural economies and sedentism being problematic, 'a truism in anthropology is that hunters and gatherers are mobile and agriculturalists are sedentary' (Hard & Merrill, 1992, 601). Much research has gone into the quest for the discovery of the beginnings of domestication of plants and animals, and this has drawn attention away from the broader question of how mobile communities changed to permanently settled, more complex communities (D. R. Harris, 1977b, 402). This can serve as an illustration of the logical problems involved in the issue, since the sedentary-agriculture correlation is not determinative.

Scholars have frequently made assumptions that the economies of early communities had a deterministic correlation with their social systems and degree of residential sedentism. However, it has become apparent, both from archaeological and ethnographic evidence, that communities such as the Siriono of Eastern Bolivia (Holmberg, 1969), the Marind Anim of Irian Jaya, the Rarumi of northern Mexico, the Pawnee and the Osage Indians can have an agricultural economy while remaining or becoming mobile (Kelly, 1992, 52). Although there is a long-term relationship between sedentism, agriculture and the sustained expansion of settlement patterns it has become obvious to scholars that agriculture can exist without the others, although this is unusual. This was well demonstrated in the 2006 issue of *World Archaeology* (38:2) subtitled *Sedentism in non-agricultural societies*, for example, with eleven articles affirming this position. The acceptance that agriculture can exist without a concomitant transition to sedentism means that the 19th century logic of unilinear progression has been decisively refuted, but as yet there is no new paradigm. Propositions now co-exist, both that the development of agriculture leads to sedentism, and, alternatively, that the development of agriculture does not [necessarily] lead to sedentism.

Although the conventions of modern western thinking are that property, including crops and animals, have to be protected from others – meaning that at least some of a community has to remain in the area where it is located – this was not the case in the past, and there are documented cases where communities are prepared to lose some of their agricultural food in order to be able to move around. For example, in the 18th and 19th centuries AD the Pawnee, who lived along the tributaries of the Missouri River, lived for part of each year in villages of durable buildings. In the spring they were located in these permanent villages, practising horticulture, but in June they moved away from their crops to the High Plains to hunt bison, living in temporary shelters. In August they returned to

their villages to harvest, leaving again in late October or November to live in tipis for the winter hunt (Parks, 2013).

In 2000 Belfer-Cohen and Bar-Yosef wrote that there was 'clear evidence to indicate that sedentism occurred independently of the development of an agricultural way of living in the Near East'. They argued that there was evidence of sedentism in some Mousterian Middle Palaeolithic sites in Israel and in the Early Natufian complex hunter-gatherer societies nearly 3,000 years before agricultural communities began (Belfer-Cohen & Bar-Yosef, 2000, 20). Although they suggested using bioarchaeological and archaeological evidence to indicate sedentism, they did not specify what length of residence in one location they were considering as sedentary. Hence the problem, as discussed below for differing classifications of complex hunter-gatherers, of whether what is being referred to was sedentism, since if it was not, then no case exists that sedentism can develop independently of agriculture.

Residential mobility and sedentism in newly agricultural communities: Bulbeck noted that there were many views on the processes involved in the adoption and expansion of agriculture, using two recent books by Bellwood (Bellwood, 2005) and Barker (Barker, 2006) to illustrate diametrically opposing positions on this. Bellwood had posited that the transition from foraging to farming had started in a small number of places and then spread out, whereas Barker had attributed the transition as localised in response to factors like climate change, population growth and changing ideologies (Bulbeck, 2013, 557). Fuller, Willcox & Allaby noted that refinements in scientific methods and accumulation of genetic evidence was changing perceptions of a single core area of origin of domestication in the Fertile Crescent 'pointing increasingly towards multiple geographical origins'. They posited that hunter-gatherers had understood how plants reproduced, both by seeds and tubers and that techniques of helping them to do so had been practised in different parts of the world. However, they theorised that because little evidence remained in the archaeological record before the adoption of sedentism and the larger-scale processing of crops, traces of these practices were ephemeral (Fuller, Willcox, & Allaby, 2011, 628, 642-643).

In re-evaluating horticulturalists' mobility strategies and the relationships between gardeners, foragers and village-dwellers, Kelly noted that 'variables that affect foraging are also relevant to horticulture, for both can be evaluated in terms of time, returns, cost, and risk'. As an example of this he cited Preucel, who had argued that increased population levels would have led to greater distances that some farmers would have had to walk. Kelly also noted that some scholars (e.g. Gilman, Powell, Preucel and Wills)

considered that pueblo and pithouse dwellers in the American Southwest had been more mobile than previously assumed, with seasonal rather than year-round sedentism in the Basket Maker and Pueblo periods (Kelly, 1992, 51).

Marshall cautioned that scholars should not regard sedentary hunter-gatherer communities whose economies have rich natural resources as practising a form of agricultural intensification. She noted that these communities are exceptions which demonstrate the rule, rather than promoting new models of the 'package deal'. Marshall wrote that the different examples of sedentism in non-agricultural societies covered in *World Archaeology 38(2)* (Special Edition: Sedentism in non-agricultural societies) were not just isolated exceptions to a rule but presented strong patterns which called for explanations relevant to each specific context (Marshall, 2006, 155-156). Recent research initiatives connected with the beginning of sedentism include two from the Universities of Liverpool and Reading/Southampton. The *Earliest Village Societies Research Group* project (Liverpool) is focusing on the origins and evolution of human settlement from the late Pleistocene hunter-gatherers to the development of early urban communities, covering a broad range of issues (Liverpool, 2015). The *Neolithic Stepping Stones* project is conducting research on five island groups around the north and west of the United Kingdom to understand more about the Mesolithic/Neolithic transition and the beginnings of settled agriculture in the United Kingdom and Ireland (Reading, 2015).

Dillehay, Eling and Rossen reported on irrigation canals constructed by societies which were not using ceramics in the Peruvian Andes, where there was a move to plant food production with an apparent (or assumed) concomitant increase in sedentism, social interaction and permanent agricultural fields and canals. This had begun to develop before 2,500 BC, with evidence of the introduction of small gravity-fed irrigation canals at about 4,700 BC. This irrigation farming developed alongside a hunting and gathering economy as the local population increased. Dillehay and colleagues noted that irrespective of the causes of the development of agriculture, the construction and management of human-made wetlands and the change from foraging to food production was a form of economic intensification. Multi-household communities that maintained ecosystems developed several millennia after the beginning of plant cultivation in the Andes. Dillehay and colleagues commented that the commitment to agriculture in that area not only 'reflected' the transition to a sedentary lifestyle but also resulted from responses to organisational changes in society and increased risks and uncertainties with the dependence on irrigation agricultural technology. What they do not demonstrate is that the communities were actually sedentary in the sense that we understand in the present day. In this period, there was a population increase, and the architecture changed

from circular to rectangular structures. They also posited that agricultural produce had been as important as marine foods in the development of civilisation in coastal Peru between 3,500 and 2,000 BC (Dillehay, Eling, & Rossen, 2005).

8.6 The issue of the development of agriculture

In discussions of the evolution of domestication, Rindos considered differing scholastic views on the circumstances leading to the development of agriculture and whether or not sedentism, with its concomitant population increases, was a causative factor. He noted that in 1977 Redman had suggested that low population density was just as likely as high population density to lead to the development of agriculture, and that Bray, using an evolutionary-ecological model of cultural change, had eventually theorised that population pressure had been the prime factor in cultural evolution. Rindos went on to conclude that although it was 'reasonable to assume that external factors may have facilitated the transition to a more sedentary way of life', the concept that the growth of agricultural systems themselves, with increasing yields in highly localised regions, could have led to increasing sedentism did not need to be rejected. This related to a dynamic interaction between population numbers and local productivity which led to major changes in the regional carrying capacity, with concomitant changes in human foraging patterns. (Rindos, 1984, 174). Rindos also theorised that the origins of agriculture were the result of changes in feeding behaviour mediated by the evolution of domesticates, especially the low-valued resources forming a minor proportion of the diet. He posited that 'the development of sedentism is tied to the development of the agroecology', with permanent residency enhancing the food intake changes that brought about the eventual evolution of agriculture (Rindos, 1984, 175).

Rindos remarked that the non-mobility of plants made them ideal and easy 'prey'. When a mobile community entered an environmental patch at a particular season when an agroecology was developing, they would have found plants with a low calorie content which required a relatively high level of processing but for which no transport was required. Rindos wrote that increasing agrilocality would support the evolutionary pressures which favoured specialised domestication, and that as communities returned to a particular location over time the yield from the domesticates there would increase. The energy saved by not having to make forays to gather plants could instead be used for elaborate processing of those domesticates. Rindos noted that the time requirements for the preparation of the domesticates did not need to compete with that required for foraging activities – processing could take place at any time and in all weathers and by

people not able to go outside the camp. This could lead to more time being spent in particular camps, and over long periods of time would lead to a transition from full mobility to seasonal camp occupation and eventually to sedentism. Rindos pointed out that in these circumstances sedentism was encouraged rather than caused by interactions with the food supply, and that many other processes would also have had effects on the development of settlements (Rindos, 1984, 176-177).

It was also noted by Rindos that his analysis of domestication demonstrated that it was possible that long-distance foraging expeditions for large game, rather than the use of abundant local resources, might have been the most innovative aspect of sedentism. This led him to question why settlement and the development of agriculture had not happened more quickly, and what processes had reduced the rate at which specialised domestication had developed (Rindos, 1984, 178). In 2005 Bellwood wrote that settlement sedentism was 'widely believed' to be a very important factor in the last hunter-gatherers making the transition to agriculture. He noted that many scholars believed that agriculture, particularly in the Levant, 'could only have arisen among sedentary rather than seasonally mobile societies' (Bellwood, 2005, 22).

In 2007 Norton wrote that it was by then accepted that Korea had been a secondary region for the adoption of agriculture, with domesticated rice and millet spreading from China, and with the population changing from reliance on hunting and gathering in the Neolithic to full-scale agriculture in the Bronze Age. Although there was some evidence for sedentary settlements in the Korean Neolithic, Norton noted that in the Incipient Neolithic the hunter-gatherer population had been at least 'semi-mobile'. Semi-subterranean pithouses in sedentary villages with storage pits situated along the coast and inland river basins had appeared in the Early Neolithic (c. 6,000-3,500 BC), continuing in the Middle Neolithic (c. 3,500-2,200 BC), when there was evidence of the cultivation of wild cultigens such as foxtail and barnyard millet and with sedentary villages further inland. In the Late Neolithic (c. 2,200-1,500 BC) there were changes in settlement patterns and in diet, with deep-sea fishing and hunting, changes in shell-fish collecting and increased cultivation of wild cereals and other domesticated plants such as rice. Norton discussed the behavioural ecology diet breadth contingency model in relation to these populations. He noted that when population density increased and resources were strained, if the foraging efficiency was not maintained then the diet would have had to include lower-ranked resources, or the community would have faced emigration or even extinction. If a hunter-gatherer group was sedentary, and therefore territorially restricted, their mobility options would have been limited, emigration would have become more difficult and they might have been forced to trade with other, better-off, groups. Norton posited that by the

beginning of the Holocene, the Korean Neolithic people were able to lead a sedentary or semi-sedentary lifestyle with a concomitant increase in population which led to territorial circumscription, food intensification and greater reliance on domesticated plants such as millet and rice (Norton, 2007). However, this categorisation could be interpreted as covering a very wide range of residential possibilities.

Lu studied the origins of millet farming in the Yellow River Valley. She found that green foxtail does not need human attention when growing, and theorised that farmers could have left the crops for four months, returning at harvest time. Lu wrote that the first farmers must have had their own territory, and that protection would have been required when the crops were ripening. She posited that although sedentism would not have been necessary for the tending of some plants the necessity to protect them prior to harvesting could have been 'a strong impetus for the occurrence or increase of sedentism' at a time when foraging was still the major subsistence strategy for those first farming communities (Lu, 2002, 10-11). But this, of course, reflects the 19th century western conception of property, not a behavioural universal of humankind. The farmers could just as possibly come and gone and located close to their crops on an episodic basis.

Arlene Rosen considered the social responses to climate change in the Near East and the ways that climatic oscillations, particularly small-scale variations, affected a region's agricultural potential. She noted that many scholars had overlooked this factor in seeking to reconstruct carrying capacities of an area. Rosen pointed out that the use of annual rainfall averages to estimate agricultural potential in the Near East is misleading, because in many years the rainfall will be below or well below the average, which would have resulted in severe water crises. Although small-scale subsistence farmers might have survived with buffering strategies, they would not have allowed a large settlement to be solely dependent on dry farming in semi-arid regions. Such conditions would have necessitated strategies such as floodwater farming, hydraulic systems, large-scale storage and the development of social networks for support in famine. Rosen also noted that responses to environmental change are affected by how communities perceive the reasons for the change (A. M. Rosen, 2007).

8.7 Identifying Sedentism by Material Markers of Culture in the Archaeological Record

There have been many different criteria set down as material indicators of sedentism, as discussed in Chapter 2. Whilst there is some consistency in these indicators, it is not

universally accepted that they do in fact provide a definitive indication of the transition to permanent settlement, and the so-called 'material correlates' of sedentism can also occur in mobile societies (see Edwards 1989 and Fletcher 1995, for example). Nor is the consistency necessarily an indicator that the correlation is valid. The use of new technologies and other methods and modelling is leading to reassessment of sites and earlier assumptions of residential status. Gamble stated that he had shown that 'it is no longer possible to regard material culture as a simple reflection of systemic developments' (Gamble, 2007, 271). There are also cases of anomalies in expected patterns. Mobility, too, may not always be obvious from the archaeological record. Until some unambiguous indicators are specifiable, there will continue to be ambiguity in the scholarship.

In 2005, Bellwood had noted that the identification of prehistoric sedentism was one of the hardest archaeological tasks. He wrote that biological indicators could give ambiguous results, and although the presence of people during a particular season can frequently be assessed, their absence is harder to determine. Bellwood wrote that generalised assumptions are often made, based on things like permanence of structures and the presence of commensal animal species. He wrote that there are few indications of 'absolute sedentism' in the archaeological record. He noted that in the terminal Pleistocene and early Holocene 'even a high degree of sedentism' was probably not practised in many areas apart from the Levant, south-eastern Turkey, Jomon Japan (without agriculture), the Sudan and possibly central Mexico and the northern Andes (Bellwood, 2005, 22-23).

Again writing in relation to sedentism in non-agricultural societies, Marshall noted that in all the papers in *World Archaeology 38(2)* the nature of the dwellings and settlements was a crucial central indicator of a sedentary community. She posited that 'faunal evidence offers perhaps the most robust method for determining the precise seasons during which a site was occupied (Marshall, 2006, 157-158). However, although faunal evidence might indicate that a site could have been occupied for all seasons of a year, it does not necessarily prove that it was occupied continuously, as demonstrated by the Dena'ina (see discussion above, Ellana, 1990). Some further physical markers would be needed to provide confirmation of this. Kelly noted that both archaeological and ethno-historical data had demonstrated that in some areas there had been significant reductions in residential mobility without agriculture or with only minimal agricultural assistance, leading to some re-examination of the concept of sedentism (Kelly, 1992, 49).

Past-Present Analogies: In the Introduction to *Chiefdoms and Other Archaeological Delusions*, Pauketat questioned why archaeologists were using the 'delusional constructs of their non-archaeologist colleagues to explain the ancient past'. He suggested that archaeology had 'an inferiority complex', and that some scholars believed written historical texts or ethnographic documentation were superior to what remained in the archaeological record. Pauketat pointed out that archaeologists have direct access to the material and spatial dimensions of people's lives in the past through their artifacts, spaces and places, and can explain the past in unique ways (Pauketat, 2007, 2-3). Similarly, Meadow wrote that many scholars attempt to interpret the archaeological record by identifying patterns and then trying to match them with an existing category, such as chiefdom, state, sedentary, nomadic, agricultural or pastoralist. Alternatively, they define the categories and then try to find them in the archaeological record (Meadow, 1992, 261). As discussed in Chapter 1, ethnographic analogies derived from studies of present or recent communities are not appropriate for consideration of the prehistoric transition to and maintenance of sedentary behaviour, particularly because mobile societies today have undergone another 10,000 years of cultural adaptation, have had contact with sedentary societies and in many cases have adopted part of the material culture of those sedentary societies (Hitchcock, 1987, 384; Renfrew, 2001, 101-102). Rosenberg noted that the ethnographic record contradicted social models of sedentism and that a misunderstanding of evolutionary processes inhibited the adaptive models (Rosenberg, 1998, 653).

Mobiliary Items: Ceramics were once considered as a marker of sedentism (as discussed in Chapter 2), on the premise that too much energy was expended in their construction for communities to manufacture them and then abandon the heavy and fragile articles when they moved. Fagan, for example, posited that large-scale ceramic production was only viable in 'more sedentary settlements' (Fagan, 1995, 377). This, however, is not in line with Rafferty's findings in an ethnographically documented study that 42.5% of non-sedentary communities produced ceramics compared with 79% of sedentary groups (Rafferty, 1985, 133).

Having described the communities of Natufian culture people and their Middle Euphrates counterparts as 'something akin to an affluent forager expression', with a 'significant degree of settlement sedentism, some degree of social differentiation, and a high population density', Bellwood noted that '*actual* archaeological evidence for Natufian sedentism' or for social differentiation in that period was not perfect (Bellwood, 2005, 52-54). He wrote that in Saharan Africa 'it seems that cattle herding and pottery-making preceded plant domestication, and animal domestication in its early phases went hand-in-

hand with mobility, not sedentism' (Bellwood, 2005, 104). Again, there is ambiguity and fluidity in the '"self-evident" interpretation of these findings.

In North China, the transition from small mobile groups to sedentary communities began in the early Holocene, starting c. 9,700 BC, demonstrated by new settlement features and artefacts which included grinding stones and, in most cases, pottery. Liu and colleagues conducted functional analyses of two grinding stones from a burial at Donghulin dated to 9,220-8,750 BC. These studies suggested that grinding stones were used for the processing of plants, particularly acorns, which had provided an important food at that site prior to the introduction of agriculture. Liu and colleagues suggested that there might have been pathways to Neolithisation in China which differed from the traditionally accepted views, and that functional studies of artefacts from more sites could lead to a greater understanding of the transition to sedentism in that part of the world (Liu et al., 2010, 2630, 2638).

Although stone tools in themselves are not directly related to the processes of sedentism or as evidence of domestication, they can provide indications to support other data sets and provide information for testing of behavioural models. Odell cautioned, however, that 'the kind of data chosen must be appropriate to the questions being asked' (Odell, 1998, 568).

Infrastructure: In the past, scholars generally considered that communities who used some method of storage of food supplies would have necessarily have had some degree of residential stability, if not actually living a fully sedentary existence. Now, however, it is more generally accepted that some mobile communities also used storage facilities. Bettinger noted that:

> 'just about everyone agrees that hunter-gatherers who store differ fundamentally from those who do not: they live at higher population densities and are more complex socio-politically… … In the same way, and for essentially the same reasons, all the above authors agree that sedentary hunter-gatherers differ fundamentally from mobile ones'

He continued by positing that some arguments for the causes of sedentism and territoriality in hunter-gatherer populations were only valid if the population were using energy-maximising strategies. Bettinger argued that in fact it is the transition to energy maximising that is the important factor that needs further investigation and explanation (Bettinger, 2001, 172).

In a 2011 article entitled 'Home is where we keep our food: The origins of agriculture and late Pre-Pottery Neolithic food storage' Kuijt noted that recent studies have shown 'how new food storage practices must have changed communities ability to overcome seasonal risk and food shortages'. He posited that this would have strengthened the necessity for people to remain in one place and to allow households to control resources while becoming more reliant on food storage. Kuijt also noted that while archaeologists have known of the importance of food storage and its material correlates they are only beginning to quantify its scale and ways to recognise it. He suggested that part of the problem was the lack of visibility of some forms of Neolithic plant storage. Kuijt also theorised that some of the circular buildings at Ain Ghazal which had been labelled as 'cultic' could in fact have been used for food storage or preparation (Kuijt, 2011).

In a paper published in 2001, Renfrew identified personal/family residential constructions as a very significant consequence of sedentism. This led to other permanent installations, including for storage, which heralded 'commodities'. Renfrew acknowledged that mobile economies, particularly transhumant and nomadic pastoralist ones, also had some of the features of sedentism. However, he stressed that because stored foodstuffs were normally essential for survival in a sedentary community, 'sedentism favours the development of property', particularly ownership of personal or group property. Renfrew listed the use of the oven and the developments in pyrotechnology as further important components of a sedentary lifestyle (Renfrew, 2001, 101), continuing the convention of durability equals sedentism.

By contrast, Kelly noted that 'even when the conditions for sedentism appear to exist (e.g. resource abundance and/or large scale storage), there is not always archaeological evidence of sedentism', suggesting that in order to maintain maximum foraging return rates, foragers would need to move residentially 'even if it is energetically possible to remain in one location'. He concluded that 'resource abundance may be a necessary but is probably not a sufficient condition for sedentism'. He also wrote that 'understanding sedentism involves understanding the relationship between residential and logistical mobility, between movement of the camp and foraging … (or gardening)'. Kelly noted that archaeologists need to identify the actual availability of food in a location in order to measure resource abundance and evaluate the sedentism hypotheses. He noted that there had only been a few cases documented where there had been continuous year-round occupation of villages where food resources were available throughout the year within accessible foraging distances (Kelly, 1992, 53-54).

In her doctoral thesis Ullinger noted that dried foods would have been more available on a year round basis to sedentary communities, rather than to mobile groups who did not have storage facilities. She also noted that although it has in the past been assumed that secondary products from produce such as olives, figs and grapes had been important in exchange networks, there was growing evidence that they had been consumed locally in the Early Bronze Age in the southern Levant (Ullinger, 2010, 172). But as has been shown in this chapter, the Jomon are a good example of hunter-gatherer communities which cannot securely be claimed to have been permanently settled but who used extensive storage facilities. Storage pits were seen from early in the Incipient Jomon period, but were different from the later mass use of storage pits which demonstrated 'a carefully planned annual schedule of food storage' (Imamura, 1996, 105). The proposition made by Ullinger therefore only applies if it is argued incorrectly that mobile populations do not store food resources.

Kelly noted that many scholars still regarded the presence of dwellings as evidence of year-round sedentism, despite historical evidence to the contrary. However, he cautioned that it was necessary to understand the factors involved in the construction and preservation of housing, and Kelly also noted that communities that become territorially constrained may have returned to the same places each year, which Binford had termed "embedded mobility" (Kelly, 1992, 57). This is, however, mobility, as John Jewitt (Alsop, 1815) was aware from his time in capture by the Northwest Coast Indians. On this same issue, Finlayson and colleagues identified the three basic assumptions that are often made regarding PPNA settlements:

> '(i) that the presence of stone or mud architecture indicates sedentism; (ii) that most buildings are domestic and can be described as houses forming small permanent villages; and (iii) that any buildings not fitting this pattern are "special", with some communal function, frequently assumed to be ritual as opposed to a domestic norm, including the tower at Jericho, monumental stone-pillared structures at Göbekli Tepe, and communal buildings at Jerf el Ahmar and Mureybet'

They argued that these assumptions need to be re-examined following their excavations at the WF16 PPNA site in southern Jordan, questioning whether basic domestic structures can really be identified in such early settlements. Finlayson and colleagues noted that many PPNA sites had no standard form of domestic architecture, with a broad range of specialised buildings unique to individual sites. They concluded that 'these settlements appear to be all about community and not about emerging households' (Finlayson et al., 2011, 8183, 8185).

Liu and Chen set down criteria they used to investigate levels of sedentism in Chinese contexts, rather than determine whether a settlement was or was not sedentary, primarily because Chinese archaeologists have not yet systematically recorded data relating to some of the reported archaeological markers for sedentism (as discussed in Chapter 2). These citeria were:

> '(1) higher levels of investment in architectural construction, such as larger buildings and well-finished walls and floors;
> (2) higher frequencies of storage pits;
> (3) increasingly well-arranged spatial plan of a settlement, such as regular layout of cemeteries and dwellings, and fortification around the village;
> (4) increased thickness and density of archaeological deposits;
> (5) higher frequencies of domesticates, particularly pig and cereals;
> (6) increased use of functionally specific vessels with less concern for their portability; and
> (7) a contrast between higher frequencies of primary refuse inside dwellings and de facto refuse (particularly caches) in activity areas, indicating the mobile tradition, and higher frequencies of secondary refuse in designated residential areas (e.g., refuse pits near houses), indicating increased sedentism' (Liu & Chen, 2012, 127).

This list is a characteristic case of the problematically self-evident, for while these criteria could indicate what had been a permanently sedentary community, the same indicators can also be seen in communities which exhibit mobility, such as some of the complex hunter-gatherers. Greater numbers of instances do not make them more characteristic of sedentism. They are not, therefore, diagnostic markers of permanent sedentism.

Large Structures: Recent archaeological discoveries in places such as Gobekli Tepe, Boncucklu Höyük and the Ness of Brodgar have led to more questions than they have answered. In the past, many scholars assumed that large monuments represented at least some social complexity by their makers, if not a fully sedentary community, and that the presence of ceramics and monumentality "must mean religion". As Gillespie wrote in comparison of archaeological evidence from Africa and North America:

> 'It can no longer be assumed that monumentality is a sign of social hierarchy, any more than that the lack of monumentality is a sign of societal organisation lower on some evolutionary ladder. Instead, the erection of monuments – intended or otherwise – likely played a key role in transforming social structures' (S. D. Gillespie, 2013, 312).

As research progresses, further anomalies and questions arise. In the UK, the discovery of the 2.5 hectare "ceremonial" complex at the Ness of Brodgar, on Orkney, and its surrounding areas is leading to the revision of concepts of the Neolithic in the British Isles. Despite there currently being no evidence of actual occupation or of domesticated animals or plants at Gobekli Tepe, its main excavator, Schmidt, initially identified it as a regional centre for complex rites and wrote that it 'contributes to a completely new understanding of the process of sedentism and the beginning of agriculture'. This was in part because in his view the symbolism in the sculpture would have allowed communities to share culture and identity (Schmidt, 2010, 239, 253-254). It should be noted, however, that mobile populations also can use art – the highly mobile desert Australian Aboriginal populations, for example, had a spectacular art tradition, as did the Upper Palaeolithic cultures of Western and Central Europe. Schmidt later theorised that Gobekli Tepe might have been used as a burial complex, and, before his death, was proposing to excavate behind the walls (Schmidt, 2013b). Schmidt also stressed that Gobekli Tepe was not a settlement, but noted that what was required for its construction 'is indicative of a complex, hierarchical social organization and a division of labor involving large numbers of people' (Schmidt, 2013a, 53).

In a review of an exhibition of monuments from Anatolia, James noted that Childe's theories on conditions in the Near and Middle East had had a world-wide and lasting influence on the study of early farming and sedentism. James questioned whether social organisation could have changed sufficiently to bring about rapid innovation in hunter-gatherer groups between 12,000 and 10,000 years ago, and noted that in both the north coast of Peru and in the Mississippi, monuments had been constructed without dependence on agriculture. He wrote that 'the discovery, beside the Euphrates, that sedentism came first made good sense', and posited that discoveries from Gobekli Tepe suggested that 'far from causing sedentism, agriculture responded to it'. The archaeological evidence for 'lengthy residence' at Cayonu and other similar sites suggested that commitment to place had come first, followed by agriculture (James, 2007, 784-785).

Assessing the propositions about monumentality and seasonal movement will require consideration of other large monumental structures constructed by populations which were probably still residentially mobile. This would include constructions such as those built by the Inuit and the complexes in coastal Peru such as Las Haldas and Caral and even Stonehenge, given the mobile status of the British Neolithic agrarian populations. Using large monuments or constructions as an indicator of sedentism is clearly not

definitive, and again presents logical problems because communities with at least some form of mobility also constructed them.

The key issue is that there are currently no conclusive material culture correlates. As Edwards noted more than 25 years ago:

> 'We may be forced to concede that the characteristics of early sedentary sites near the mobile/sedentary transition are more strongly influenced by particularistic local, historical developments, than those characteristics stemming from universal organizational principles underlying sedentism. It is certainly difficult to discern any of the latter which have been unequivocally identified.' (Edwards, 1989a, 38)

8.8 Conclusions

The "self-evident" background in linear stage theory appears to have hindered new theorising on the transition to a sedentary lifestyle. The debates and issues surrounding what are termed complex hunter-gatherers and the concentration on the search for the origins of agriculture and continued focus on early agricultural societies have diverted attention from the issue of how and why people became sedentary. Assumptions such as "if there was agriculture, the people must have been sedentary", or the assumptions about the purported material markers of sedentism such as "communities with substantial and durable materials must there have been sedentary", have a deep intellectual ancestry and have continued to hinder new research and ideas.

What is apparent is that many of the previous assumptions about sedentism have changed or been challenged during the last fifty years and even correlations between the material and the social have begun to be destabilised. There is now more consideration being given to human spatial behaviour, and its relationship to sedentism. This chapter has highlighted several of the major issues and their implications in relation to the current status of research into the subject of sedentism and the discussion of the transition from a mobile lifestyle to a sedentary one. Various issues have been conflated and the ambiguities continue to affect the way in which scholars view sedentism have obscured the topic of sedentism and derailed the focus away from its consideration.

Chapter 9: Conclusions: Pathways to explanation and resolution

'Current explanations for the evolution of fully sedentary life-ways suffer from serious deficiencies. Social models are contradicted by the ethnographic record and beg as many questions as they address, and adaptive models are hampered by a faulty understanding of evolutionary processes and contradicted by the fact that the ostensible "benefits" of sedentism are not true benefits at all.' (Rosenberg, 1998, 653)

9.1 Introduction

The study of the transition to sedentism remains an explanatory conundrum in archaeology. Why the topic has been, and remains, in this situation has been the central topic of the structural assessment in this thesis**.** The majority of the thesis has been concerned with highlighting the nature of the scholarship about the topic through time and why the debate has repeatedly stalled. The argument is that the debate has stalled because its core issues have remained tacitly grounded in old linear directional stage theory and progressionism, combined with a general lack of agreement about what prehistoric sedentism actually was and how it operated, due both to assumed self-evidence and regional localism which produced a condition of ambiguity.

While some of the issues relating to transitions to sedentism such as the development of agriculture have been clarified, others remain fundamentally unresolved. Many of the old assumptions about the transitions are also now being called into question. One of the main unresolved issues concerns what sedentism actually was, or what the term refers to, at the time of the initial, prehistoric transitions. Making sense of the argument will not be possible until issues of terminology have been sorted out. Why this is important is demonstrated by Renfrew's recent comments questioning why the cultural trajectories which led to complex societies had taken so long to develop and positing that the key to human cultures becoming more substantive and more material might have been the adoption of a sedentary lifestyle (Renfrew, 2012, 126-127). If sedentism is to be such a grandiose and definitive cause, the imputation is that it is obvious – essentially self-evident – when it occurs. But if it "causes" the material and we identify it through the material with no other independent means of appraisal, then we are involved in circularity. We still do not know on cross-cultural grounds what it looked like, when we are seeing it commence, and how it functioned, although the practitioners of the discipline of archaeology do tend to write as if we do.

9.2 The issue of What is Sedentism?

The issue of sedentism, and hence of sedentising, confronts problems of metalogic, that is issues at the level of the fundamental logic which defines how the discussion is taking place. What sedentism is or is not has been taken for granted in previous discussions, and there is thus neither a coherent "question" being considered nor coherent agreed classifications, definition or indices, nor coherent models of how sedentism operates. Scholars assume that there are coherent, cross-referential questions to be answered, but the ambiguity in the terminology means that the same topic question or set of issues is not being considered in each case. These factors interact with each other, compounding the difficulties surrounding the debates.

Investigation of the development of sedentism and of transitions from mobility will require rethinking how archaeologists deal with these problematic questions and the tools that can be used to resolve them, together with the question of the lack of suitable theory. In discussing the later Mesolithic material cultures of Britain and Ireland, and the transition to the Neolithic, Kador pointed out:

> 'Changes in material culture do not necessarily represent a shift in subsistence economy (from hunting and gathering to farming) and in settlement pattern (from highly mobile to more sedentary). In fact, finding a common denominator for these phenomena represents arguably the greatest challenge to early prehistoric research in Northwest Europe.' (Kador, 2010, 147).

As McCarter noted in 2007, 'perhaps the most significant new realization is that the Neolithic transition was haphazard rather than part of an inevitable linear progression of human culture from hunting/gathering to urbanism' (McCarter, 2007, 11). Bailey and Whittle cautioned that as scholars attempt to move forward in their discussions, concepts of the traditional 'Neolithic package' should not be replaced by what they termed 'a more fashionable but equally unfounded orthodoxy of gradual piecemeal adoption of domestication, sedentary life and Neolithic material culture'. They wrote that what was required were more highly detailed studies, investigated without preconceptions or assumptions (Bailey & Whittle, 2005, 6-7). But this, of course, is not logically possible, as preconceptions and assumptions are built-in to the way humans think and inquire and underlie scholarship in archaeology, as in any other field. The core issue is how we assume one can and/or should reason about the topic and what procedures might be developed to rigorously and cross-culturally specify what will identify what we are looking for. A coherent discussion or a coherent scientific analytical process will be problematic if the basics being used are not resolved. Propositions that scholars "just get

on with it" will not provide resolution. The subject has to be considered in the context of thinking about the whole conceptual frame of reference for the problem.

Pluciennik wrote that 'many of the "big" questions of origin and transition in (pre)history and archaeology are predicated upon a certain view of the past which often derives directly from the stages defined by social evolution' (Pluciennik, 2005, 15). Sterelny & Griffiths, discussing evolution and complexity, wrote 'the idea that evolution is progressive is particularly problematic, both conceptually and empirically' (Sterelny & Griffiths, 1999, 282- 284). How serious the rethinking needs to be can be illustrated by the key issue of the way scholars have tended to perceive sedentism and mobility on a linear continuum as if it is self-evident, but actually is not (as Whitelaw (1989) and Fletcher (1995, 166) noted, and the self-evidence creates contending ambiguities. The linearity assumptions are expressed in several apparently "self-evident" propositions about issues such as gradations from fully mobile to fully sedentary and that settlement size and community size correlate to that continuum. That may be an apparently self-evident assessment, but it is just an assumed one. If, however, there was not necessarily a linear path from mobility to sedentism, or from small communities to bigger ones that correlated with it, then the entire phenomenon and the factors involved do not correspond with the expectations that are built into familiar assumptions. That there may be a fundamental issue of dissonance between assumptions and actuality can be illustrated by a simple but different way of plotting the basic data of country and settlement size and then relating it to known patterns of mobility and sedentary life. This can be done by plotting data on settlements and communities of different sizes, residential density and duration of occupation as has been done by Whitelaw and Fletcher.

Whitelaw (Whitelaw, 1989) observed that as population size increases, mobile settlements can exist with small populations at high population density, but as community size increases, residential density drops (Whitelaw, 1989). That aggregating in bigger groups has a behavioural cost is illustrated by the drop to low density. Fletcher (1995) showed that, by contrast, sedentism tends to produce or allow an increase in density as population size increases, but it can also generate trajectories to massive low-density settlements with huge populations as, for example, the extreme agrarian-based Greater Angkor with an area of 1,000 sq. kms. and a population of about 750,000 people (Fletcher & Evans, 2012). What is revealed in the Interaction/Communication model approach (Fletcher, 1995) is that several different trajectories can be defined. There are two or more paths to what become large communities (of up to circa 40,000 people in one place) through different modes of sociality and mobility and differing degrees of mobility and sedentism. As noted in Chapter 2, even urban settlements, such as the capital of Ethiopia in the 16th

century and prior to 1892, could be mobile, moving across the landscape on a seasonal basis.

Some of the complex hunter-gatherer communities such as the Northwest Coast Indians at the time of initial contact with Europeans, moved on a seasonal basis, remaining for several months at a time at one location and then returning to base settlements. The populations and areal extent of complex hunter-gatherer settlements varied considerably, but could reach large population numbers (Fletcher, 1991, 395). Reading "complex" hunter-gatherers as being somehow on the way to being sedentary or as being sedentary, or on a linear trajectory, is not a valid assumption. They are, rather, on a trajectory or trajectories of their own, creating communities which could have quite large populations which continually reassembled after periods of seasonal mobility. On this view, a form of mobility allows communities to form which were as large as typical agriculturally-based sedentary villages. Settling permanently does require other things such as a form of communication which could reach across expanded settlement areas, ways of providing sufficient privacy through settlement layout, walls and building construction (Fletcher, 1995, 23-24, 83-90), and ways of dealing with the issues of ill health due to the proximity of waste or to animals which were carrying diseases. But it is not apparently the only path to large community sizes, as the Ethiopian capitals demonstrate. The problem of analysing sedentism arises from what scholars think they are looking at. They have in the past tended to think that sedentism is the main precondition for settlements to have large populations but an alternative set of plural trajectories can be proposed on the basis of current ethnographic and archaeological evidence – the issue now is how to proceed. This is not an argument about what sedentism was, but rather noting what trajectories are possible now, and therefore were operationally possible in the past.

Sedentism is an issue of behaviour not an issue of intent. It does not concern what people in communities thought they were doing but what they were actually doing. Being sedentary means that the behaviour of the inhabitants of a community is impacted on by others in ways that do not apply to mobile people, and this has long-term consequences. Some communities could have stayed for long periods in one area, becoming accustomed to the resources on the landscape. However, without behavioural prerequisites which could have shielded them from the interaction stresses such as conflict and waste materials, and managed the communication demands of staying in one place, they would not have been able to settle down permanently because they had not developed what is necessary for communities to be fully sedentary.

However defined, sedentism is therefore a deep-seated behavioural phenomenon, rather than a high-level social one, although specific and probably very varied social changes are associated with it, and this presents interpretational challenges for archaeologists. In addition, unlike other enquiries in archaeology, there is no external referent in the form of an explanatory foundation derived from another discipline on which the debate can ground itself. Biology offers no appropriate guide to a behavioural analysis of sedentising – though in principle it might. The prehistoric transition which we refer to as a move to sedentism needs to be understood as a global, world-wide, cross-cultural phenomenon which occurred in a relatively short time frame compared with the evolution of modern humans and which has had significant consequences for the future development of agrarian-based urbanism after 3000 BC and beyond. What is involved is a question of operational analysis, that is what sedentism does, not a definition of what sedentism is, and it requires an understanding of how sedentism operates. A study of the interaction between the material and the social is required, rather than assuming correlations between the material and the social. How the social and the material interact in sedentism has not yet been resolved despite persistent assumptions about correlation. In addition, in order to reach a resolution on the topic of sedentising and to remove the current ambiguity, an agreed specification of the issues scholars are looking at will be required, together with undisputed and definitive markers for sedentism.

9.3 Logic, Theory and Practise in the Study of Transitions to Sedentism

As noted earlier, the basic factors which have led to "self-evident" assumptions and ambiguity originated with European scholars who, as far back as the 19th century, and in some cases earlier, set out an almost automatic progression of humans from savagery to civilisation in terms of stage theory. This is combined with assumptions based on localised or rather selective knowledge about archaeological markers for sedentary communities which can in fact also occur in mobile ones. The basic problem is the ways in which the topic has been constituted and discussed. The issue is that the prevalent positions in archaeology seem to lead to a situation in which sedentism is being understood in a way that that may be at odds with the actual nature of the phenomenon, which is further complicated by the odd mix of the self-evident and the ambiguous. "Self-evidence" has been perpetuated by assuming either that sedentism and what it is are obvious or that the way in which sedentism worked in the past can be recognised by the material patterns and practises associated with known sedentary communities in the recent ethnographic record.

Three main areas encompassing basic logic, the form of theorising and the practice of regionality, which are all fundamental to archaeology, need to be considered in relation to the study of sedentism. They can be summarised as:

Logic and the uniqueness of sedentism: Whatever sedentism is, it is unique to humans, and probably just to modern humans. Because of the absence of a large-scale behavioural analogy with other species, sedentism has to be understood independently, and the fact that scholars cannot borrow theory from elsewhere means that the logic of the analysis of the phenomenon is critical. However, the logic of analysis in current practice is founded on an inappropriate use of analogy and retrodiction, which normalises the past in terms of a present that has evolved from that past. The use of ethnographic analogy was discussed in Chapter 2. The primary issue relating to the phenomena which is referred to as sedentism is not what it is, but how it works – in this context, more specifically how the prehistoric transition to sedentism took place and what was involved. The basic problem is that retrodicting from the past is logically invalid as it premises a continuity that has to be examined, not assumed. Furthermore it requires an assumption that material entities are determinate correlates of social phenomena. This, first of all, is an equivalent logical fallacy to the more general one. It assumes a correlation which should actually be the topic of inquiry. Also, if, as Fletcher has argued and shown, the material features now associated with behaviour like sedentism are prerequisites for that behaviour, rather than correlates of it, then the material features such as durable, multiroom, and rectilinear structures must occur before sedentism, and therefore have to be features that mobile communities were able to produce. Correlations between material things and the operational characteristics of a community cannot be presumed, if a material feature can be a prerequisite which long precedes the behaviour which it is useful for managing (Fletcher, 1995).

In order for questions of residential stability in prehistoric communities to be answered, it will be necessary to find unequivocal, unambiguous markers in the archaeological record. Such markers are likely to be either biomechanical or biochemical, especially since the work of Whitelaw and Fletcher on density, group size and degrees of mobility indicates that stress factors would have been involved in a transition to sedentism which should have some biophysical indicator. In recent years significant advances in technologies have led to changing perceptions and greater scientific definition on this topic, as discussed below.

Theory and the operation of sedentism: Whatever sedentism is, it is a deep-seated behavioural phenomenon, as noted above, not directly one of familiar social categories, although social changes were presumably associated with it. The issue is that we cannot securely extrapolate back from current social categories. Archaeologists have been using a set of theoretical conventions derived from stage theory which are problematic, for example tending to assume that if a community was agricultural it must have been sedentary or applying modern western concepts of property and ownership. The current propositions use correlations and are analogical and definitional (if this – then that) rather than analytic and operational. The important issue is not where sedentism falls in a hierarchy of residential behaviour but how it operated. If the ways in which sedentary communities actually operated in the past are not understood, deciding whether there was a continuum between mobility and sedentism, and then deciding where a community fell on a presumed continuum between mobility and sedentism, will not be possible. In general, archaeologists are not experienced in dealing with behavioural phenomena as distinct from overlaying social terminology on the material (see Fletcher, 2004, 2010; Pauketat, 2001 and others). The theorising that takes place concerning transformations in human behaviour is at odds with the general phenomena which are involved in sedentism and the transition to it. The lack of agreement on the terminology used in the theorising has led to the current state of ambiguity.

Because it is a deep-seated behaviour and is unique to humans an operational analysis is needed in order to demonstrate what it actually does in humans instead of defining it in contrast with something else. In order to understand what humans are doing, we have to understand how that behaviour operates, not define what it is or just decide how to label it. Actual outcomes are important, not correlations, because there are no identified simple material correlates for sedentism. Ambiguous definitions continue to be problematic. Theories of behaviour involving mobility in primates and the various types of pastoralism in humans will need to be considered, as will the non-correspondence between the material and the social, in order to ascertain what constitutes sedentism and to show how it operates. An operational analysis will need to consider the non-correspondence between the material and the social as outlined in difference theory (see Fletcher, 2004, 2010; Fletcher & Evans, 2012, for example).

Practice – regionality and the cross-comparison of sedentism: Whatever sedentism is, it is a global phenomenon and has deep-seated consequences of global significance. Global cross-comparison is required. The ambiguity in archaeological understanding has been compounded by intense regionalism and views that residential categories can be

sufficiently understood in terms of local meaning. The core of the problem is that these different approaches have led to a definitional approach, such as that sedentism = xxx. However, this obscures the necessity to understand how sedentism operates. Because this has not yet been done on a global scale, debate and discussion on the topic of sedentism effectively goes round in circles, ultimately leading to the strange situation of self-evidence and ambiguity. The issues are not "how can each region deal with it" but rather how it operated globally, why it matters, why it is necessary to understand the processes involved and how each region had a distinct version of the process. Comparing regional differences in order to see global similarities across regions is the clue to operational consistency, irrespective of some small-scale local differences. By comparing different regions to see what is the same in each will allow scholars to recognise what is general across regions, so that the operational processes involved can be studied. Because it is (and was at its origin) a global, world-wide, cross-cultural phenomenon, it is necessary to have consistency and agreement amongst scholars, particularly in relation to designating the operational characteristics and consequences of sedentsim. It will be necessary to move away from regional considerations and focus on local areas towards an international agreement. As Marshall has pointed out, because most archaeological investigation is highly region-specific, the change in scholars' understanding of what sedentism really is has been obscured (Marshall, 2006, 155).

Scholars have to be able to understand regional differences in terms of the disparate ways in which communities in different parts of the world have changed their residential practices to get to what are effectively the same end points. Current definitions of sedentism and mobility do not facilitate this, and regional differences preclude a comprehensive enquiry. A global solution is likely to involve the discovery of definitive biochemical or biomechanical markers for sedentism in humans. It will also be necessary to consider mobility in order to provide answers on sedentism, and there may be universal markers which are indicative of mobility.

The conundrum is that, using currently available technologies and analytical methods, scholars cannot conclude that a community was fully sedentary until it can be ascertained that its members had been living continuously in one place perhaps even for significantly longer than a single year. However, this is still essentially impossible to identify from the archaeological record alone, and this is all that is available for the initial (prehistoric) transition to sedentism. Therefore the definition of sedentism cannot rely only on difference of time spent in one location or the percentage of the population who remain there year-round. In addition, as Ogilvie pointed out, 'mobility versus sedentism is

difficult to distinguish conceptually' (Ogilvie, 2006, 155), which has added to the difficulties in resolving some of the ambiguities.

9.4 The Problems and the Possibilities of Identification and Indices

Many purported archaeological markers of sedentism have been claimed, as outlined in Chapter 2. However, all of these features can also occur in societies which can be considered to still be mobile and not unambiguously sedentary. Definitive markers of a prehistoric sedentary population need to be identified in order for there to be any resolution of the ambiguity surrounding its identification. The issue is what kind of markers these might be. Given the material-social correlation problem, it is likely that these will need to be biomechanical or biochemical. Setting possibilities in terms of cultural items will not be sufficient. Once communities become sedentary, there are many new circumstances they have to deal with, including such things as managing refuse, and the communities being robust enough to cope with the changed interaction patterns that these circumstances created. The patterning of refuse material may be a clue, and understanding of the contemporaneity of structures within a settlement may be a necessity.

The possibility of indices of sedentism is as yet unresolved. Some of the options are discussed below. However, the problems illustrate the magnitude of the research problem. What is likely to be necessary is a method to determine the effects which sedentism had on the individuals involved, probably the biomechanical effects of being sedentary, rather than the social relationships. Looking at the characteristics of the interactions between the different indicators will also be necessary.

9.5 Potential Cultural Material Markers – an ongoing issue

Contemporaneity: Another issue scholars can face in their assessment of sites is the problem of the contemporaneity of structures within a particular area. Conventional dating methods may not produce a fine enough result to tell whether the house structures in a particular settlement were continuously occupied at the same time nor whether they had been built at approximately the same time or at an earlier or later phase of occupation of the site. Many scholars have noted that there are often problems in identifying contemporaneity in early Neolithic sites which affects the interpretation of the site.

Schacht, for example, noted that unless it was possible to show clear stratigraphic relationships between buildings it was difficult to ascertain which ones were, or were not, in use at the same time. In addition, if structures have multiple use histories, the relationship of a particular occupation horizon with other architectural spaces becomes more difficult to assess (Schacht, 1984).

Çatalhöyük is recognised as being an important Neolithic settlement, and in its early phases was unusual in being a permanent sedentary village in Central Anatolia. Marciniak and colleagues have used Bayesian analysis of radiocarbon dates from the end of the sequence, which has provided a precise calendrical chronology for Late Neolithic deposits in part of Çatalhöyük East, which they write has helped understanding of the contemporaneity of housing, challenging the previous estimates of a 60-70 year lifespan of a Neolithic dwelling. Use of the Bayesian model has allowed for greater understanding of the way in which changes in and decline of the settlement took place (Marciniak et al., 2105, 154, 174-175).

Kennett and Culleton used a Bayesian chronological framework to reconstruct seasonality and mobility patterns and to try to resolve issues of contemporaneity on St. Catherines Island in the Georgia Bight. They posited that using a Bayesian approach provided a viable statistical framework, combining stratigraphic data with radiocarbon dates to determine more definitive and accurate chronological models and to establish whether sites were in fact contemporaneous (Kennett & Culleton, 2012, 37, 49). This type of approach could assist in assessing the number of households likely to have been in a settlement at any one time.

Refuse disposal and how it is patterned: Most studies of refuse disposal have used ethnographic examples to attempt to explain behavioural patterns in the past. Although it would not necessarily have been the case for all communities in the past, such ethnographic studies have indicated that greater quantities of detritus accumulate as communities become less mobile. Kelly theorised that the distribution of such detritus could be a better indicator of residential mobility than the more frequently used site size and artefact density as it is correlated with the length of occupation of a particular area. He also noted that there was apparently more internal differentiation in the sites of sedentary horticulturalists and recently settled pastoralists and foragers than in those of mobile communities (Kelly, 1992, 56). Edwards pointed out, however, that in O'Connell's 1977 study of Alyawara communities in Central Australia, larger refuse items were generally cleared away when a camp was occupied for more than a month. On

that basis, the distinction would only be between very short-term and short-term occupations in some communities (Edwards, 1989a, 26).

Hardy-Smith and Edwards noted that ethnographic studies of complex semi-sedentary hunter-gatherers such as the Nootka had shown that those communities lived among their refuse for long periods. European travellers to the North-West Pacific Coast in the late 18th century had been horrified at the smells and piles of rubbish and rotting foods they encountered (Hardy-Smith & Edwards, 2004, 284). However, when they moved to a different location, in some instances they dismantled their whole villages, taking the walls and roof planks (Alsop, 1815), which would have alleviated the problem in the short term at least. In their reporting of the University of Arizona's Garbage Project, Rathje and Murphy noted that in the late 1940s Willey had commented, partly in jest, that *Homo sapiens* must have been driven towards civilisation by the need for the type of sophisticated organisation and stratified class structure necessary to deal with their accumulating debris (Rathje & Murphy, 1993, 33).

Yeshurun and colleagues noted that few studies had been made of Natufian period refuse and its stratigraphy and context, despite its importance in interpretation of the architecture of the 'last hunter-gatherers'. They used taphonomic studies to assess whether animal bone deposition could be used to distinguish between short and long-term occupations of early Natufian (c. 12,000 BC) structures and help understand their use. Yeshurun and colleagues found that:

> 'the demonstrated Natufian habit of discarding food refuse in the place of consumption may constitute one of the last manifestations of such behaviour in the prehistoric sequence of the Levant' (Yeshurun, Bar-Oz, Kaufman, & Weinstein-Evron, 2014, 591-592, 605).

Interaction controls: Bandy and Fox highlighted some of the new types of challenges faced by what have been termed "early village communities". These communities were faced with major cultural and social changes, usually completely transforming themselves, in the process of changing the ways in which they had accomplished things for millennia (Bandy & Fox, 2010a, 7-8). It is necessary to consider the ways in which material things managed relationships between people (Fletcher, 1995; R. Lane, 2015). As mentioned in the Introduction to this chapter, in order for a community to become sedentary it would have to possess the means to control lines of sight and transmission of sound between households, as outlined in the Interaction-Communication model (Fletcher, 1995). Mann considered the aspects of control over sight, movement and social

interactions in her discussion of houses in the Early Iron Age settlement of Zagora, on Andros, demonstrating that in the final phase of the settlement, household layouts suggested that restriction of both visual and physical access to the internal household space had been a necessary parameter (Mann, 2015, 52, 60).

There is clearly some potential here for further elucidation of the issues, although it is not yet well defined. The problem illustrated by these possibilities is that material things could in fact have been a necessary precondition for becoming sedentary (and thus exist in mobile communities which were on a trajectory to becoming settled). It is unclear if in some situations the lack of such things could just have been tolerated by a community, and thus they cannot be an assured index of a fully settled community. Refuse patterning has real potential, but is interestingly close to being a form of biological marker.

9.6 The possibility of biological markers of change

Becoming sedentary clearly had some impact on aspects such as group size, human physiology, diet and reproduction. The biochemical markers indicating where people have lived, either in their childhood or later years, will be indicative of gross movement. However, the results so far available are not finite enough to assess the residential stability of the populations involved.

The issue of Seasonality: Seasonal markers have been cited as a possible indicator of sedentism. However, as Muniz pointed out, seasonality is a subtle phenomenon to detect, and requires considerable knowledge about the biology of the species involved (Muniz, 1998, 37). Many scholars have produced diagrams and charts showing multi-seasonal availability of various kinds of resources, often based on modern studies. However, having availability of different resources in one location throughout a year does not necessarily mean that people were actually living permanently in that location from season to season or from year to year.

Milner pointed out that it would be necessary to clarify what is meant by the term sedentism before deciding whether seasonality can be used to identify it. Different techniques and criteria are used to evaluate the year-round availability of resources from excavated archaeological evidence. Milner pointed out that reliance on analogy with modern habits, birthing patterns and distribution of migratory animals, birds and fish may be inaccurate because such patterns can change and may not be reflective of past

conditions She concluded that, as a starting point for using seasonal markers to identify sedentism, it would be necessary to have a secure context in which it could be ascertained that all the floral and faunal material had been deposited during one year, with evidence of activity throughout the year. She, too, noted that large sample sizes were required and that there were inherent wide margins of error. This type of study might show that there was long-term occupation at a site, but it was 'difficult, if not impossible, to demonstrate that they were ever sedentary' or that it was the same group of people using the site continuously. Milner wrote that 'in reality, both sedentary and mobile people use lots of different sites or locations in the landscape for many different reasons (Milner, 2005, 33-35).

Lieberman's cementum increment analyses of samples of gazelle and other fauna from Levantine sites demonstrated that large sample sizes were necessary to infer seasonality (Lieberman, 1998, 85). Adams and Bohrer noted another issue, that when there is an abundance of a crop available to harvest, people usually save some for the future, writing 'the problem of determining seasonality of occupation is inextricably linked to aspects of both plant and human behaviour' (K. R. Adams & Bohrer, 1998, 129). This would also affect the way that storage systems are interpreted.

For the Calusa, Scarry and Newsom assessed the seasonal availability of fleshy fruits from the Charlotte Harbor archaeological samples. This showed that although in some seasons, particularly September to November, there was an abundant variety of different fruits, there should have been at least one type of fruit available in each season throughout the year. They cautioned that the sample contents were highly variable, with no apparent patterning across the sites which could have been due to poor preservation or the archaeological sampling methods used (Scarry & Newsom, 1992, 391, 394). Milner highlighted possible margins of error in the assessment of availability of resources, and detailed a hypothetical scenario of possible seasonality from remains of sheep, shellfish and swans based on assumed months of death. Although this could be used to show year-round food sources, Milner cautioned that these results may be misleading (Milner, 2005, 34-35). Barnes noted that Japanese archaeologists had produced subsistence calendars for the Jomon period which showed availability of different resources during different seasons. There were considerable regional differences in abundance of resources, and Barnes commented that one solution for a community might have been mobility in order to take advantage of periods of plenty in different areas (Barnes, 1993, 76-78).

Seasonal change was observed in the interpretation of the archaeological material from Catalhoyuk. Fairbairn and colleagues noted that, as with hunter-gatherer groups, the

community's survival depended on its ability to manage seasonal lows in availability of food resources and the interpersonal stresses such shortages produced. They also posited that seasonal changes could have led to some degree of logistical and residential mobility, despite the apparent permanent sedentary occupation of the site (Fairbairn, Asouti, Russell, & Swogger, 2005, 93-94, 103).

Examination of phytolith remains from the houses of forager groups in the Southern Levantine Mediterranean area has added to the understanding of available resources in the Early through to the Late Natufian Periods. Rosen noted that difficulties in the identification of residential units in prehistoric hunter-gatherer societies in the Near East had limited the number of studies of the households. She wrote that phytolith analysis is 'one very effective method for identifying the remains of perishable structures' in hunter-gatherer sites, as well as of the use of space. Her studies demonstrated that there were changes through the Natufian period. She speculated that grasses would have increased the sustainability of high-ranked resources close to households, which would mean the resources could be continually exploited from a sedentary base (A. M. Rosen, 2012, 179).

It can be seen from the above sample that there are increasing possibilities for the assessing the likelihood of there being economic resources available on a seasonal or year-round basis at a particular location. However there is still a lack of scientific tools to accurately assess the length of occupation of a site or whether it actually occupied continuously throughout all the possible seasons of a year rather than, for example, being episodically visited in every season of the year, as the Dena'ina do.

Group Size: Sociologists have noted that there is a relationship between neocortex size and group size in primates, including in hominins, and that all the members of a group know or at least recognise each other. Dunbar has noted that humans have a neocortex ration of 4:1, leading to a predicted natural group size of about 150. As humans now live, to a great extent, in non-natural large urban groupings, Dunbar studied modern humans still living a hunter-gatherer lifestyle. While acknowledging that their lifestyles and beliefs would have been affected by contact with other societies, he theorised that their grouping patterns might not be much different from those pertaining in the past. Dunbar noted that temporary overnight camps typically had five or six families and 30-35 people. The largest grouping was tribes, consisting of 1,500-2,000 people. There were also mega-bands of about 500 people and the basic clan-type grouping of about 150 people, which appeared to be the largest group size in which everyone knew each other and how they were related. This grouping size of 150 occurred in many situations. For example,

archaeologists have calculated the earliest Near Eastern farming villages at c. 5,000 BC typically had about 150 inhabitants and modern horticultural villages in Indonesia, the Phillipines and South America also have about 150. Dunbar noted the accepted principle in sociology that 'social groupings larger than 150-200 become increasingly hierarchical in structure'. The unit size of around 150 has been used in many different modern institutions, from the Mormons' Great Trek from Illinois to the Church of England's ideal congregation size to military companies, and Dunbar concluded that:

> 'human societies contain buried within them a natural grouping of around 150 people. These groups do not have a specific function: in one society they may be used for one purpose, in another society for a different purpose. Rather they are a consequence of the fact that the human brain cannot sustain more than a certain number of relationships of a given strength at any one time. The figure of 150 seems to represent the maximum number of individuals with whom we can have a genuinely social relationship…' (Dunbar, 1997, 69-75).

Bocquet-Appel defined the demographic limit at which a hamlet became a village by the same figure of 150 people, or 'the cognitive limit of integration by the human brain of numbers of interpersonal relationships'. He theorised that where sedentary forager villages were established in areas of resource abundance they were marginal exceptions, and their economic system, being constrained by the limits of nature, had little margin for demographic growth (Bocquet-Appel, 2011, 561). However, the general proposal is that as communities became sedentary, population numbers increased substantially.

Bioarchaeological and demographic markers. Bar-Yosef and Belfer-Cohen suggested that bioarchaeological evidence could add to the evidence of permanent structures and storage facilities in defining sedentary settlements (Bar-Yosef & Belfer-Cohen, 1992, 24). Recent epigenetic research (such as reported by D. Smith, 2012) has suggested that when there are chemical modifications to DNA which do not actually alter the DNA itself, but switch genes on or off, after environmental or dietary changes, this will be rapidly reversed once the changed conditions are reversed, even after several generations. This type of reversal would mean that humans who had adapted to a settled lifestyle would be able to revert easily to a mobile lifestyle if necessary.

In 2000 Belfer-Cohen and Bar-Yosef wrote that the transition to sedentism was not a straightforward process, but was what they termed a 'crossroads', as communities made changes depending on their specific socio-economic circumstances. They wrote that there was clear evidence that sedentism had developed independently, and earlier than, agriculture in the Near East, writing that there was evidence in Middle Palaeolithic

Mousterian sites in Israel of complex hunter-gatherer societies which were sedentary. Belfer-Cohen and Bar-Yosef also noted that with the increase in the use of bioarchaeological and demographic markers of sedentism, archaeological remains were now providing only secondary evidence. They pointed out, in addition, that although most of the markers which were presumed to indicate sedentism had been found in the archaeological record of the Natufian culture, there was no evidence of intergroup violence from that period, which might have been expected if the communities had been sedentary (Belfer-Cohen & Bar-Yosef, 2000, 20).

In a key study, Shewan's comparative analysis of strontium isotopes in fossil fauna and archaeological human skeletal tissue from Natufian culture period sites in the Near East found that there was in fact little difference in the mobility of the two groups, with the exception of animals which were kept in enclosures, and thus particular Natufian sites could not securely be said to have been occupied year-round. Her comparative study showed 'a pattern consistent with regionalism and the localized procurement of food resources'. Shewan pointed out that Natufian residential stability needs to be carefully considered, because it is 'fundamental to any discussion of the origins of food production and its relationship to sedentism' (Shewan, 2003, 285-286).

Similar studies utilising strontium isotopes to examine a range of related questions have been conducted by other scholars such as Webb, White & Longstaffe, Boric & Price and Eerkens, Barford, Jorgenson & Peske (Boric & Price, 2013; Eerkens, Barford, Jorgenson, & Peske, 2014; Webb, White, & Longstaffe, 2013). Hodell and colleagues used the spatial variation of strontium isotopes to test hypotheses about migration and sedentism in the Maya region. They found that, despite some issues needing to be resolved, strontium isotopes 'represent a powerful tool for identifying geographic "outliers" in ancient burials and tracing the origin of individuals' (Hodell, Quinn, Brenner, & Kamenov, 2004, 583, 595) . Nafplioti similarly used strontium isotope ratios to determine likely geographic origins in the Aegean. Nafplioti suggested that it would be worthwhile for future research to test other isotope systems such as oxygen, lead, neodymium and sulphur to try to get higher resolution on the question of such geographic origins (Nafplioti, 2011, 1569).

Makarewicz examined nitrogen and carbon isotopes in dentinal collagen from sheep in Mongolia to identify winter pasturing practices, noting that the techniques had the potential to address broader subsistence strategies and tracking mobility as well as identifying animal husbandry practices (Makarewicz, 2014). Guerrero and colleagues tested whether fluoride dating of human dentition in PPNB burials in Syria could give a greater understanding of the phases in individual households. They concluded that it was

a valuable method to distinguish between the approximately thirty year phases in village life (Guerrero, Schurr, Kuijt, Anfruns, & Molist, 2011). Kamenov and Gulson did experiments with the lead isotopic record in ancient and modern human teeth, finding that the lead isotopic signal could be used as a geo-referencing tool (Kamenov & Gulson, 2014, 868). Further work might identify whether these types of studies can produce some indicator for sedentism.

Skeletal characteristics: Recent research on human preferences for certain facial characteristics by Scott and colleagues have challenged previous concepts on preferences for exaggerated facial sexual characteristics relating to long evolutionary processes. Instead they posit that preferences for dimorphic facial characteristics are found primarily in developed urban environments, possibly because of exposure to large numbers of unfamiliar faces (Scott et al., 2014). This sort of exposure would have started with the transition to sedentism.

Skeletal gracility of modern *Homo sapiens* was compared with earlier populations by Ryan and Shaw, analysing proximal femur trabecular bone structure from four distinct populations of mobile foragers and sedentary agriculturalists with similar anatomy. They found that the forager populations 'had significantly higher bone volume fraction, thicker trabeculae, and consequently lower relative bone surface compared with the two agriculturalist groups', with 'a correspondence between human behavior and bone structure in the proximal femur'. They also commented that the trabecular bone structure of the more mobile human populations was like to that of non-human primates with comparable body mass (Ryan & Shaw, 2015, 372).

Reproduction: It is possible that the key issue may be hidden in the biology of reproduction. In 1989, Spielmann reviewed scholarship on the effects of dietary restrictions, including food taboos, on communities of modern female hunter-gatherers and the way this impacts on reproductive capacity and infant mortality. Undernourished girls tended to reach menarche later than those on more complete diets, which meant that they would not become pregnant at an early age. Low body fat frequently led to cessation of menstruation, again restricting fertility, and long periods of breast-feeding after giving birth delayed the return of normal menstrual cycles (Spielmann, 1989). Storey reported similar effects (R. Storey, 1992, 11-12) Harris posited that if communities of sedentary agriculturalists and of mobile hunter-gatherers settled in a valley, within three hundred years there would only be the sedentary community left, as they would have outbred the

mobile hunter-gatherers with their more limited fertility (D. R. Harris, 2008). Body fat ratios in women go up in agricultural societies, and thus menstrual cycles become more regular as those communities settle down. Changes may be determined in the pelvis, and in the microflow of blood.

There is obviously potential from a wide range of fields, with studies showing possibilities for assisting in the identification of sedentary communities in the past. These will need to be assessed in greater detail in future studies, and could assist in removing some of the ambiguities caused by the lack of definitive terminology. These appraisals will not be based on associational analogy but an operational equivalence, in order to understand how the system works and what physical characteristics are likely to be indicative.

The biomarkers can demonstrate what can be seen both in the present day and in skeletons from the past. However, as noted above, they are not yet providing finite enough answers to assess whether populations lived in one location throughout all seasons of a year or for several years at a time. As is the case today, people may move from one location to another, living in sedentary communities each time they move.

9.7 Changes in health

Several studies have demonstrated that skeletal and other biological changes do occur when a population changes its residential behaviour. Further investigation of these sorts of changes opens a possible path to recognising sedentism in the archaeological record, but as yet they are primarily just associates of changes of diet. This will need further research and consideration. Although many of the physical techniques used for living populations, such as bone densitometry and histomorphometry can also be applied to skeletal remains, Nelson and colleagues caution ‘it is impossible to obtain dynamic or longitudinal measurements of physiological processes, or to assess diet and physical activity accurately’. They continued with the comment that anthropological techniques could create reasonable models of health and life in past population (D. A. Nelson, Sauer, & Agarwa, 2004, 3).

Although not directly correlating with the adoption of a sedentary lifestyle, Cohen noted that based on population estimates there was a strong argument for an overall decline in health with the adoption of sedentary agriculture. He commented that the advent of improved techniques and interpretations of skeletal pathology had enabled greater

accuracy in the determination of mortality rates. If average fertility increased after the adoption of farming, then there must have been an increase in the mortality rate to produce the very slow overall actual population growth (possibly 0.1% per annum) from the adoption of agriculture to the time of Columbus. Cohen noted that this does not necessarily indicate constant mortality or fertility rates or equal conditions in every region, but it does imply that there was increasing mortality in most places after the adoption of agriculture (Cohen, 2007, 6-7).

Douglas & Pietrusewsky identified what have been reported as typical indicators of general decline in health throughout the world with increased sedentism and/or the adoption and intensification of agriculture. These include 'increases in fertility, caries, linear enamel hypoplasia, cribra orbitalia, trauma, and infectious disease, while mean age at death, dental attrition, and stature all decline'. They also noted that there was significant local variation in the timing and the health effects of sedentism and agriculture (Douglas & Pietrusewsky, 2007, 317). This is supported by many of the chapters in *Ancient Health: Skeletal Indicators of Agricultural and Economic Intensification*, papers from a 2004 conference on palaeopathology (Cohen & Crane-Kramer, 2007). Although it is generally assumed that the development and intensification of agriculture led to a population increase, Douglas & Pietrusewsky found skeletal material from Non Nok Tha, in northern Thailand which did indicate a decline in fertility in that period (Douglas & Pietrusewsky, 2007, 311).

Archaeological skeletal material from two sites in north-eastern Thailand was examined by Douglas and Pietrusewsky in their study of the biological effects on human health resulting from the intensification of agriculture. They found that traumatic injury was most common at the transition to a more sedentary and more intensified subsistence economy and that there was an increase in infectious disease through time at one site (Non Nok Tha), both of which they identified as consistent with increasing sedentism and intensifying agriculture. The other site (Ban Chiang) provided what they described as 'enigmatic evidence for health effects of intensifying agriculture'. There was an apparent increase in fertility but decreased life expectancy over time and the trends in dental pathology were mixed, but the archaeological evidence 'supports a more or less continuous sedentary settlement' (Douglas & Pietrusewsky, 2007). Quite how secure this claim is remains uncertain.

Molleson examined some of the skeletal material from Abu Hureya to determine whether there were obvious occupational markers, and what that could add to the knowledge of the site. There were significant differences between skeletal material from the earlier levels

and those from the Neolithic. In particular, there were collapsed dorsal vertebrae and arthritic big toes. These they associated with kneeling for many hours while grinding cereal grains on the saddle querns found at the site. The areas where the deltoid muscles attached to the humerus and the biceps to the radius showed evidence of overdevelopment of the muscles, again probably due to the grinding actions. Similarly, the femurs had evidence of stress from bending. Kneeling while pounding seeds with a mortar and pestle could also have contributed to the vertebral deformities (Molleson, 1994). These injuries are not necessarily, of course, restricted to sedentary people. Mobile people also use querns and pound grains.

In 1995 Larsen published a review of the literature on biological changes in humans after the development of agriculture. Whilst acknowledging that there would always be biases in the archaeological evidence available, his evaluation showed that human remains could provide a useful model of past health and behaviour. Larsen noted that the decline in dental health following increasing carbohydrate in the diet was one of the most striking changes, with a prevalence of dental caries and ante-mortem tooth loss. Tooth size, associated with poorer nutrition, declined during the Holocene. Larsen noted that children's growth rates were also a good indicator of nutritional status (Larsen, 1995, 186-190). Larsen also reported on other physical changes in newly-agricultural populations. He highlighted several studies which demonstrated 'a consistent pattern of reduction in cranio-facial robusticity and/or vault shape in populations that underwent the transition from foraging to farming, both in the Old World and in the new World'. Larsen noted that studies of the remains of agriculturalists showed declining life expectancy with the transition to agriculture, and wrote that a re-evaluation of the demographic profiles in those studies suggested that 'the mean age-at-death is related to fertility and birthrate, and not mortality', with populations which were expanding having more younger members and a larger proportion of juvenile skeletons relative to adult skeletons. There was some evidence that some late prehistoric agricultural communities had been involved in conflict, which would have increased the risk of early death. The causes of such conflict were unknown, but Larsen speculated that they could have involved competition for resources and productive land, which was becoming increasingly limited. Larsen noted in conclusion that biological changes had not happened uniformly across populations which adopted agriculture. This was particularly noticeable in differences in dental health and activity patterns in both male and female adults (Larsen, 1995, 196-198, 204).

Roberts & Manchester noted in 2005 that there had been a recent increase in studies (e.g. Capasso, Kennedy, & Wilczak, 1999) of the ways in which changes in lifestyles such as the change from hunter-gathering to agriculture could be assessed from skeletal material.

They cautioned, however, that modern studies showed inconsistencies in the correlation of bone degeneration with specific occupations, noting that there may have been multiple activities undertaken during a day or a week which could affect the body even though with a very heavy manual occupation a particular patterning can occur. Osteoarthritis has been used in the consideration of variations in activity in differing economies. Roberts & Manchester noted that there was greater longevity in many of the hunter-gatherer groups studied, and posited that this could have had an effect on the development of osteoarthritis, compared with the agriculturalists who died younger (C. Roberts & Manchester, 2005, 143-144). Saunders analysed long bones of juveniles from prehistoric North America which showed evidence of retardation of growth in mixed-subsistence and agricultural communities (Saunders, 1992).

Eshed and colleagues studied musculo-skeletal stress markers in Levantine populations of Natufian period hunter-gatherers and of farmers from the Pre-Pottery Neolithic period, concluding that there had been higher loads on the upper limbs in the agricultural populations compared with the hunter-gatherer ones. They noted that the pattern of stress markers in male and female skeletal remains indicated that there was a gender-based division of labour in both the Natufian and the Neolithic periods and that in the Neolithic females might have taken over many of the subsistence activities that previously had been carried out by males. Eshed and colleagues also noted that there were contradictory opinions in published literature on the biological impacts of the transition to agriculture and that both negative and positive impacts had been claimed (Eshed, Gopher, Galili, & Hershkovitz, 2004, 303, 314).

Trends in available data showed a decline in health over time in England as communities became more complex and agriculture intensified. However, Neolithic populations there had apparently relatively little disease, which Roberts & Cox theorised was probably because of the low population density. They found that linear enamel hypoplasia had, however, increased gradually through time until it declined in the Iron Age (C. Roberts & Cox, 2007, 160-161).

The Chalcolithic site of Inamgaon (Western India, 1,400-700 BC) showed evidence of a change from moist to arid conditions combined with a change from sedentary farming to a semi-nomadic hunting and foraging lifestyle (c. 1,100 BC). Lukacs and his colleagues predicted that this would have led to a reversal in human biological responses to the changes in their residential status, and their research confirmed this. They found that the response was most clear in permanent teeth, with a decrease in dental caries and an

increase in dental dimensions as they reverted to a hunting and foraging economy (Lukacs, 2007, 249).

Alfonso and colleagues noted that there could be quite different health outcomes for communities that were located in different environments within a relatively small area. They studied the health effects of the adoption of agriculture on various coastal and inland communities in the Azapa Valley region in Northern Chile. The Azapa Valley is part of the Atacama Desert, with 'extreme temperatures, daily thermal oscillation, scarce vegetation, and high soil salinity', whereas the coastal area has abundant and varied marine, terrestrial mammal, avian and insect resources. In the Archaic period (c. 7,000-1,700 BC) hunter-gatherer-fisher communities (said to be semi-sedentary) lived on the coast. At the beginning of the following Formative period, some of them moved inland, living in villages with a mixed economy. Life expectancy decreased in the inland village communities but increased in the coastal ones, compared with the previous period. The inland population showed an increase in enamel hypoplasia, which Alfonso and colleagues theorised was due to permanent settlement associated with changes in food production. They also theorised that there was a decrease in the quality of life in the inland communities, but not the coastal ones, after the adoption of agriculture, even though some of the communities lived only thirteen kilometres apart (Alfonso, Standen, & Castro, 2007). It is not clear whether the changes related to their diet or to their residence.

Smith and Horwitz examined the changing health status during the transition from a hunting and gathering economy to agropastoralism in the Neolithic period in the Southern Levant between 11,000 and 5,500 BC. They found that there was an overall trend towards skeletal gracilisation and reduced tooth size which began in the Upper Palaeolithic, before the adoption of agriculture, and which accelerated between the Early Natufian period and the PPNC. During the thousand years covering the Late/Final Natufian and the PPNA there was a decline in health which was coincident with the change from foraging to incipient agriculture. Smith and Horwitz attributed this to an overall decline in diet and nutrition compounded by greater competition for resources. As animals later became domesticated, infectious diseases became endemic, even showing up in the semi-nomadic pastoralist groups through cross-contamination, lasting through to the time of the introduction of antibiotics. This was also seen in similar Bedouin groups in the area in the early 20th century. The skeletal evidence showed two low points in human health in the transition to agropastoralism in the southern Levant – during the Late/Final Natufian-PPNA and during the LPPNB-PPNC periods. At these times, there was evidence of

environmental stress with the abandonment or diminution of many settlements or a change in occupation intensity (P. Smith & Horwitz, 2007, 221).

In her 2010 doctoral thesis, Ullinger discussed the relationship between changes in skeletal health and increasing sedentism and agricultural intensification during the Early Bronze Age at Bab edh-Dhra' in Jordan, testing three hypotheses relating to increasing sedentism and agricultural intensification: that there was an increase in dental pathology, that there was a change in daily activity and that the later Early Bronze II-III community were not new immigrants. She studied changes from the Early Bronze Age IA (c. 3,150-2,950 BC) to the Early Bronze Age II-III (c. 2,800-2,300 BC), a time period which covered the expansion of fortified towns in the Southern Levant and found that despite the change to small-scale agriculture there was no change in the occurrence of dental caries. Although there were some differences in the evidence of degenerative joint diseases covering different parts of the body, it either stayed constant or declined from EBIA through to EBII-III. She also found insufficient evidence to conclude that there was any immigration in the later periods, and concluded 'the changes seen reflect changes in lifestyle and behaviour, most likely as the result of intensified agriculture and increasing "urbanization"' (Ullinger, 2010, ii-iii).

The last few decades have included investigations showing a wide range of possible skeletal and health markers of residential status. As further research is conducted in these areas of the health of past populations, the indications are that indices of health may be able to be used as a more definitive marker of whether a community was mobile or sedentary.

9.8 Overview

Humans are the only primates who live a permanently sedentary lifestyle, and this leads to logical, theoretical and practical problems of analysis and interpretation. Because a transition to sedentism is unique to humans, archaeologists have not been able to use cross-referents from other disciplines, unlike for some other aspects of human conduct. Although some animals, such as various rodent species, and insects such as ants, do form and live in permanent "sedentary" colonies, there is no apparent, comparable theory on the *formation* of sedentary behaviour in other animal species. As noted earlier, this has meant that archaeological theorists cannot "borrow" theory from the biological sciences to insert into an interpretation of the archaeological record or against which to test their predictions on the change to a sedentary lifestyle for humans. The issue is not being

sedentary – as some other animal species are – but changing from mobility to become sedentary and what was involved in that change.

The recognisable initial transitions to which the label "sedentism" is attached, occurred long before writing or other recording systems were introduced. Therefore no historical referent or analogue is available either. Nor can ethnographic analogy using modern or recent cases of societies becoming sedentary be used as an index for the initial sedentary transition, as the modern cases have involved contact with and knowledge of obviously permanent, sedentary communities. There is also no deterministic correlation of early economies and degrees of residential sedentism, as is sometimes assumed. While it may be the case that agriculture sustains sedentism that does not mean that sedentism could not begin with some other economy and then fail. In addition, it has not been demonstrated that particular material forms correlate with particular social forms (Drennan et al., 2012; Fletcher, 2004, 2010), and therefore material-social analogies cannot logically be used. Rather than an associational analogy borrowed from ethnography, an operational analysis will be necessary to study the relationship between the material and the social.

The trajectories of abrupt settlement size increase which are found all over the world in the size range from 1 to 20 hectares, in the period from c11,000-2000 BC in the Old World and 4,500 BC-500 AD in the New World (figures 1 to 8) show there is a phenomenon or phenomena to be considered, but do not tell us what it was. However, while there is no doubt that transitions to sedentism were involved in some of these various regional trajectories, they may only represent one of several processes, rather than a single process, since settlement size in this size range can increase due to a variety of factors, not just due to sedentism, and can also indicate the occurrence of complex hunter-gatherer communities whose residential permanence or mobility is much debated. One of the main issues concerns what sedentism actually was, or what the term represents, at the time of the initial, prehistoric, transition or series of transitions. Because a spectrum of definitions of sedentism and sedentising is in use, ranging from the majority of the population remaining at the same location through some seasons of the year or the entire year to opinions that between five and twenty years or more of continuous residence is necessary, as argued by Muller-Wille, Fletcher and Jones & Wood, even the nature of the phenomenon to be considered is ambiguous. Not only are there ambiguities in how sedentism is identified in terms of descriptions, but there are also ambiguities in the interpretation of those descriptions. Consideration needs to be given to the ambiguities in, and lack of definition derived from an understanding of how sedentism operates, both now and in the past. There are problems in the terminology used, such as the description

"semi-sedentary" or alternatively "semi-mobile" and the question of whether they are the same or different needs to be posed.

The propositions about sedentism remain inconsistent. The basic problem is that sedentism has tended to be understood as something self-evident or has been subsumed under some other topic like domestication or has been left in an ambiguous and hence curiously "safe" place where research can continue without resolving the issues. Until sedentism is rethought and an operational definition of sedentism is produced, rather than an assumed conventional standard definition, and until a secure index of its presence has been identified, the fundamental issue of sedentism and how it occurred will remain obscure. Because of the issue of the non-correlation between the material and the social, the necessary index will need to be biomechanical or biochemical. However, currently biochemical markers are not generally diagnostic for sedentism but in fact for identifying mobility.

Many issues have not been resolved in the ongoing debate and discussion on the question of prehistoric transitions from a mobile lifestyle to a fully sedentary one. The overview of the history of opinions on such transitions demonstrates that there are some deep logical problem and inherent ambiguities which need to be resolved. These issues have to be resolved in archaeological theory, and cannot be submerged in other theories about topics such as domestication or co-evolution. The problem is unique to archaeology, and is a metalogical, rather than simply an empirical, problem. Given that neither conventional stage theory, nor the habitual analogising from material to social correlates will suffice, this is a considerable problem. As Marshall has cautioned 'archaeological understanding of the adoption of sedentism is less clearly articulated than is the case for pottery or agriculture' (Marshall, 2006, 154). The issue has still not been considered in depth because of lingering assumptions and preconceptions and cannot be resolved until there is recognition that there many inter-related logical and practical problems, all of which have long and independent histories, as outlined in this thesis.

A fundamental issue is that scholars are still at cross-purposes in their consideration of the subject, which means that the ambiguity has not been resolved. Extremely localised meanings are often being used, frequently without reference to other scholars' definitions. But the process or processes of becoming sedentary are unavoidably a planetary, global problem, not just a regionally specific local problem. There has to be a global perspective about it, as the outcomes which are presumed to result from the phenomenon are observed globally in the behaviour of completely unrelated people, both in the New World and the Old World. Clearly many societies in countries all over the world are now predominantly

or extremely sedentary and three million years ago the ancestral hominins were not. Moving around is a habitual characteristic of primates, but human communities have developed different residence patterns. Humans have changed from living in very small groups of dozens to a few hundred people to living in megalopoli with millions of inhabitants, similar to the magnitude of difference between a small primate group and the immense aggregates of herbivores that once existed on the African savannahs. Sedentism was the biggest single transition of hominin, and hence of primate, life and it has to be understood and its analysis agreed upon globally because it is clearly a global, cross-cultural, problem. Because of the residential and social conditions that have developed over the last ten thousand years following the transitions to sedentism, wherever it was occurring and whatever it was, such as agrarian and industrial urbanism, it will be necessary to profoundly rethink what we are looking at. The explanation for the change needs to be expressed in behavioural terms – it does not sufficiently reside in the specifics of familiar local social meanings extrapolated from ethnographic analogy.

9.9 Conclusions

A series of practices have disrupted enquiry into sedentism. This study has emphasised that the problem resides in the self-evidence and ambiguity derived from these practices, creating a package of compounding problems. The whole package is the problem. Producing an answer suitable for one aspect of the issue is liable to reinforce other problems. As topics are re-examined and definitions or labels are changed, such as the more recent theories that complex hunter-gatherers were not in fact or necessarily sedentary, this affects many other positions such as the interpretation and meaning of the proposed occurrence of "sedentism without or before agriculture". Questions on the reasons or causes behind the transition to a sedentary lifestyle remain. It will be necessary for the "debate" to be rethought in order for resolution to be reached**.** Any new position on sedentism must concurrently make classificatory sense of the issues. Most importantly, scholars still need to define the question "Why did people become sedentary?" and that question remains to be answered. The issue cannot be approached on the basis of choosing one definition of sedentism – it is the question about how sedentism operates that is important, not a definition *per se*.

The fundamental issue is that scholars have for a long time been talking at cross purposes. The basic cause of the problem lies in stage theory, and the fact that the issue has not been considered in depth because of assumptions made in relation to that model. The possibility of multiple trajectories from any one starting point has not been taken up. A

further factor in the persistence of self-evidence and ambiguity is that it allows individual scholars to continue research and get on with "doing something" within a regional milieu without much consideration of complications arising from work in other regions of the world. What is actually necessary to gain a resolution on the issue of sedentising and sedentism is for the subject to be rethought on a global scale, and this will involve several concurrent steps. To assist in resolving the issues a considerable degree of discussion and co-operation will be needed. Unambiguous physical biochemical and/or biomechanical markers for sedentism are required, and a theoretical model is needed which explains what sedentism was actually doing at the time of the initial transitions and which can specify how such a trajectory developed among many possible trajectories of settlement growth and persistence.

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APPENDIX I

Reported sizes of archaeological sites (figures 1-8)

Region	Country/Province	Settlement	Period	Average date BC	Average size	Reference
Anatolia	Turkey Anatolia	Ishkaft Palegawra	Zarzian	12500	0.003	Braidwood & Hare, p 28-9
Anatolia	Turkey Anatolia	Baradiz	Neolithic	9000	0.8	Todd, 1980, SIMA IX, p 128
Anatolia	Turkey Anatolia	Cafer Huyuk	Aceramic Neolithic	7000	0.42	Cauvin & Aurenche, Anatolian Studies 1984, XXXIV: 2
Anatolia	Turkey Anatolia	Cayonu	7300-6500	6900	1.05	Redman C The Rise of Civilization p 145
Anatolia	Turkey Anatolia	Cayonou		6900	2.5	Redman C The Rise of Civilization p 153
Anatolia	Turkey Anatolia	Hayaz Huyuk	Anatolian Neolithic	6750	0.28	Roodenbrg J, Anatolian Studies XXXI, 1981, 187-88
Anatolia	Turkey Anatolia	Igdeli Cesme	Anatolian Neolithic	6500	0.4	Todd, 1980, SIMA LX: 40
Anatolia	Turkey Anatolia	Can Hasan III	Aceramic Neolithic	6500	0.78	Mellaart p. 96
Anatolia	Turkey Anatolia	Pinarbasi-Bor	Anatolian Neolithic	6500	0.79	Todd, 1980, SIMA LX: 43
Anatolia	Turkey Anatolia	Kumluk Tepe	Anatolian Neolithic	6500	1.76	Todd, 1980, SIMA LX: 42
Anatolia	Turkey Anatolia	Tepecik-ciftlik	Anatolian Neolithic	6500	3.14	Todd, 1980, SIMA LX: 44
Anatolia	Turkey Anatolia	Sapmaz Koy	Anatolian Neolithic	6500	4.9	Todd, 1980, SIMA LX: 43
Anatolia	Turkey Anatolia	Suberde		6250	0.2	Redman, R of C p. 165
Anatolia	Turkey Anatolia	Alan Huyuk	Anatolian Neolithic Phase 3	6000	0.78	Todd, 1980, SIMA LX:
Anatolia	Turkey Anatolia		Neolithic	5825	13	Mellaart 1975: 98
Anatolia	Turkey Anatolia	Kizikaya Huyuk	Anatolian Neolithic	5750	0.79	Mellaart, Anatolian Studies 1961, 11: 160
Anatolia	Turkey Anatolia	Yenikoy Huyuk	Anatolian Chalcolithic	5700	0.79	Todd 1980 SIMA LX p135
Anatolia	Turkey Anatolia	Mentese-Yenisehir	Anatolian Chalcolithic	5600	0.79	Todd, 1980, SIMA LX: 127
Anatolia	Turkey Anatolia	Ilicapinar-Orhangazi	Anatolian Chalcolithic	5600	9.6	Todd, 1980, SIMA LX: 126
Anatolia	Turkey Anatolia	Kayislar	Anatolian Chalcolithic	5550	0.31	Todd, 1980, SIMA LX: 126-7
Anatolia	Turkey Anatolia	Alibeyli	Anatolian Chalcolithic	5550	0.5	Todd, 1980, SIMA LX:
Anatolia	Turkey Anatolia	Kavaklikahve	Anatolian Chalcolithic	5550	0.5	Todd, 1980, SIMA LX: 126
Anatolia	Turkey Anatolia	Hamidiye-Nazalli	Anatolian Chalcolithic	5550	0.64	Todd, 1980, SIMA LX: 125
Anatolia	Turkey Anatolia	Nuriye	Anatolian Chalcolithic	5550	0.64	Todd, 1980, SIMA LX: 127
Anatolia	Turkey Anatolia	Ulucak	Anatolian Chalcolithic	5550	0.64	Todd, 1980, SIMA LX: 127-8
Anatolia	Turkey Anatolia	Arpali II	Anatolian Chalcolithic	5550	0.68	Todd, 1980, SIMA LX: 125
Anatolia	Turkey Anatolia	Morali I	Anatolian Chalcolithic	5550	1.77	Todd, 1980, SIMA LX: 127
Anatolia	Turkey Anatolia	Hacilar II		5450	0.78	Mellaart 1975: 111

Anatolia	Turkey Anatolia	Kurucay Huyuk	Anatolian Early Chalcolithic	5200	1.28	Duru, R. 1980 Anatlian Studies, XXXI: 195-6
Anatolia	Turkey Anatolia	Coba-Huyuk-Sakcagoz	Anatolian Chalcolithic	4750	1.26	Todd, 1980, SIMA LX:
Anatolia	Turkey Anatolia	Tepecik-ciftlik	Anatolian Chalcolithic	4750	3.14	Todd, 1980, SIMA LX: 44
Anatolia	Turkey Anatolia	Sapmaz Koy	Anatolian Chalcolithic	4750	4.9	Todd, 1980, SIMA LX: 43
Anatolia	Turkey Anatolia	Can Hasan	Late Neolithic	4700	12.5	Mellaart, 1975: 119
China	China	Fanshan	Liangzhu	2750	1	KK Hirst Archaeology (online)
China	Gansu	Dadiwan (Early)	3985 BCE	3985	10	Liu, L. 2004: 86
China	Hebei	Cishan	6000 - 5000 BCE	5500	8	
China	Henan	Jiahu	6000 - 4500	5250	6	Liu, L. 2004: 75
China	Henan	Fangjinzhai	4000 - 3500 BCE	3750	20	Liu, L. 2004: 267
China	Henan	Xiawanggang	3500 - 3000 BCE	3250	1	Zhang, Z 2005: 76
China	Henan	Haojiatai	2600 BCE	2600	4	Yang, X. 2005: 140
China	Henan	Pingliangtai	2500 - 2200 BCE	2500	3	Yang, X. 2005: 140
China	Henan	Hougang	2500 - 2100 BCE	2300	10	Yang, X. 2005: 139
China	Henan	Wangchenggang	2400 - 2200 BCE	2300	10	Yang, X. 2005: 139
China	Henan	Mengzhuang	2300 BCE	2300	13	Yang, X. 2005: 140
China	Henan	Xiacao	2500 - 2000 BCE	2250	11	Liu, L. 2004: 269
China	Henan	Qiquan	2500 - 2000 BCE	2250	11	Liu, L. 2004: 269
China	Henan	Qingdui	2500 - 2000 BCE	2250	13	Liu, L. 2004: 269
China	Henan	Tenghualuo	2500 - 2000 BCE	2250	14	Yang, X. 2005: 139
China	Henan	Puchengdian	2500 - 2000 BCE	2250	14	Liu, L. 2004: 269
China	Henan	Zhongqiugang	2500 - 2000 BCE	2250	15	Liu, L. 2004: 269
China	Henan	Guchengzhai	2500 - 2000 BCE	2250	18	Yang, X. 2005: 140
China	Henan	Zhangwan	2500 - 2000 BCE	2250	20	Liu, L. 2004: 268
China	Henan	Luokou	2500 - 2000 BCE	2250	20	Liu, L. 2004: 268
China	Henan	Daliutan	2500 - 2000 BCE	2250	20	Liu, L. 2004: 269
China	Henan	Chenggao	2500 - 2000 BCE	2250	20	Liu, L. 2004: 269
China	Henan	Changcun	2500 - 2000 BCE	2250	20	Liu, L. 2004: 269
China	Henan	Luokou	2000 - 1600 BCE	1800	15	Liu, L. 2004: 272
China	Henan	Xikouzi	2000 - 1600 BCE	1800	18	Liu, L. 2004: 272
China	Hunan Province	Bashidang		5320	3.2	KK Hirst Archaeology (online)
China	Northeast	Aoliyingzi	Hongshan 4500-3000	3750	0.75	Jia 2004 v 2 p 60
China	Northeast	Bolishan	Hongshan 4500-3000	3750	7.5	Jia 2004 v 2 p 60
China	Northeast	Chenzishan	Hongshan 4500-3000	3750	0.79	Jia 2004 v 2 p 60
China	Northeast	Donguozi	Hongshan 4500-3000	3750	0.1	Jia 2004 v 2 p 60

China	Northeast	Ganniudao	Hongshan 4500-3000	3750	0.64	Jia 2004 v 2 p 60
China	Northeast	Houobeiyingzi	Hongshan 4500-3000	3750	4.5	Jia 2004 v 2 p 60
China	Northeast	Lijiawopu Reservoir	Hongshan 4500-3000	3750	4	Jia 2004 v 2 p 60
China	Northeast	Luoguoliang	Hongshan 4500-3000	3750	8.3	Jia 2004 v 2 p 60
China	Northeast	Majiazishan	Hongshan 4500-3000	3750	1	Jia 2004 v 2 p 60
China	Northeast	Wangjia	Hongshan 4500-3000	3750	0.6	Jia 2004 v 2 p 60
China	Northeast	Xiaobeigou Reservoir	Hongshan 4500-3000	3750	18	Jia 2004 v 2 p 60
China	Shaanxi	Banpo	5000 - 4000 BCE	4500	5	
China	Shaanxi	Jiangzhai	5000 - 4000 BCE	4500	5	Liu, L. 2004: 80, Zhimm Current Anthropology 1988,
China	Shaanxi	Shuibei	4000 - 2500 BCE	3250	12	www.kaogu.cn/en_kaogu/show_News.asp?id=317&k
China	Shandong	Wangzhuang	4000 - 2600 BCE	3300	4	Liu, L. 2004:P 93
China	Shandong	Xikangliu	3000 BCE	3000	4	Yang, X. 2005: 138
China	Shandong	Dantu (Dawenkou)	3000 - 2600 BCE	2800	10	Yang, X. 2005: 139
China	Shandong	Wangjiazhuang	3100 - 2100 BCE	2600	4	Yang, X. 2005: 138
China	Shandong	Chengziya	2600 BCE	2600	20	Yang, X. 2005: 138
China	Shandong	Huangguzhong	3000 - 2000 BCE	2500	6	Yang, X. 2005: 138
China	Shandong	Bianxianwang	2300 BCE	2300	7	Yang, X. 2005: 139
China	Shandong	Youlou	2500 - 2000 BCE	2250	2	Yang, X. 2005: 139
China	Shandong	Dawei	2500 - 2000 BCE	2250	3	Yang, X. 2005: 138
China	Shandong	Lepingpu	2500 - 2000 BCE	2250	3	Yang, X. 2005: 138
China	Shandong	Shangzhuang	2500 - 2000 BCE	2250	3	Yang, X. 2005: 138
China	Shandong	Wangji	2500 - 2000 BCE	2250	4	Yang, X. 2005: 138
China	Shandong	Xizhufeng	2500 - 2000 BCE	2250	5	Liu, L. 2004: 270
China	Shandong	Dinggong	2500 - 2000 BCE	2250	11	Yang, X. 2005: 138
China	Shandong	Jiaochangpu	2500 - 2000 BCE	2250	17	Yang, X. 2005: 138
China	Shandong	Tianwang	2500 - 2000 BCE	2250	17	Yang, X. 2005: 139
China	Shandong	Dantu (Longshan)	2500 - 2000	2250	18	Yang, X. 2005: 139
China	Shandong	Laojuzhou	2500 - 2000 BCE	2250	18	Liu, L. 2004: 271
China	Shandong	Zhaojialai	2500 - 2000 BCE	2250	18	Liu, L. 2004: 271
China	Shandong	Kangjia	2500 - 2000 BCE	2250	19	Liu, L. 2004: 271
China	Shandong	Beiniu	2500 - 2000 BCE	2250	20	Liu, L. 2004: 271
China	Shandong	Xiehu	2500 - 2000 BCE	2250	20	Liu, L. 2004: 271
China	Shandong	Xigaoquan	2500 - 2000 BCE	2250	20	Liu, L. 2004: 271
China	Shanxi	Ganjuncun	2000 - 1600 BCE	1800	20	Liu, L. 2004: 272
China	Shanxi	Donglongshan	2000 - 1600 BCE	1800	20	Liu, L. 2004: 272

China	Zheijang Province	Kuahuqiao		5500	0.11	
China	Zheijang Province	Hemudu		4250	4	Hemudu Museum online
India, Pakistan, Afghanistan	Afghanistan	Lairu	Neolithic/Chalcolithic	7500	0.005	Ball, 1982, Gazetteer of Afghanistan, 1973-4
India, Pakistan, Afghanistan	Afghanistan	Shah Tepe	Epipalaeolithic	7000	1.8	Ball, 1982, Gazetteer of Afghanistan, 247
India, Pakistan, Afghanistan	Gujarat	Choteria Timbo	Anarta (Pre-Harappan)	3500	0.2	Stein, Sir Aurel, (1943), 97
India, Pakistan, Afghanistan	Gujarat	Bhamaria Thumdo	Amri-Nal BurialPottery	3500	n/a	Chitalwala, Y.M., (1985), 58-64
India, Pakistan, Afghanistan	Gujarat	Harthar-No Timbo	Amri-Nal Burial Pottery	3500	2.2	Indian Archaeology, A Review (1988-88): 21
India, Pakistan, Afghanistan	Gujarat	Madhvya-No Timbo	Amri-Nal	3500	0.1	Joshi, Jagat Pati, Madhu Bala and Jassu Ram, (1984)5
India, Pakistan, Afghanistan	Gujarat	Nagwada One	Amri-Nal	3500	1.6	Joshi, Jagat Pati, Madhu Bala and Jassu Ram, (1984),
India, Pakistan, Afghanistan	Gujarat	Kotada Bhadli One	Harappan (Mature)	1900	3	Kumar, Manmohan, (1978), 53
India, Pakistan, Afghanistan	Gujarat	Jhangar, Anjar	Harappan (Mature)	1900	8	Joshi, Jagat Pati, Madhu Bala and Jassu Ram, (1984),
India, Pakistan, Afghanistan	Haryana	Kirtan	Harappan (Mature)	1900	0.7	Fairservis, Walter A., Jr., (1956), 197
India, Pakistan, Afghanistan	Haryana	Nathwan	Harappan (Mature)	1900	0.7	Stacul, Giorgio, (1987), 63
India, Pakistan, Afghanistan	Haryana	Dhanana	Harappan (Mature)	1900	4	Singh, Amar, (1981), 108-9
India, Pakistan, Afghanistan	Haryana	Rajpura	Harappan (Mature)	1900	9.8	Mughal, M. Rafique, (1997), 42
India, Pakistan, Afghanistan	Haryana	Chanat Three	Harappan (Mature)	1900	11.5	Possehl, Gregory L., (1980), 107
India, Pakistan, Afghanistan	Haryana	Banawali	Harappan (Early / MatureTrans)	1900	16	Joshi, Jagat Pati, Madhu Bala and Jassu Ram, (1984),
India, Pakistan, Afghanistan	Kandahar	Mundigak	Togau	2400	18.7	Joshi, Jagat Pati, Madhu Bala and Jassu Ram, (1984),
India, Pakistan, Afghanistan	Kandahar	Said Qala	Damb Sadaat	2400	3.5	Indian Archaeology, A Review (1980-81): 16
India, Pakistan, Afghanistan	Pakistan	Merhgarh	MR3/4-6	6000	2	Wright 2010 p 54
India, Pakistan, Afghanistan	Pakistan	Merhgarh	MR3/4-6	4000	12	Wright 2010 p 54
India, Pakistan,	Pakistan	Amri IC-D	3100-2850 BC	2975	7.5	Fairservis 1975 App. L

Afghanistan						
India, Pakistan, Afghanistan	Pakistan	Jalilpur	3400-2550 BC	2975	15.6	Fairservis 1975 p 234
India, Pakistan, Afghanistan	Pakistan	Mehi	Kulli pre-2500 BC	2800	9	Fairservis 1975 App. L
India, Pakistan, Afghanistan	Pakistan	Pandi Wahi	pre 2300 BC	2600	1.4	Fairservis 1975 App. L
India, Pakistan, Afghanistan	Pakistan	Jhalawan	Kulli 2500 BC	2500	5.7	Fairservis 1975 App. L
India, Pakistan, Afghanistan	Pakistan	Kot Diji	Late Kot Diji 2450 BC	2450	22	Fairservis 1975 App. L
India, Pakistan, Afghanistan	Pakistan	Mehi	Kulli 2500-2200 BC	2350	8.3	Fairservis 1975 p205
India, Pakistan, Afghanistan	Pakistan	Kulli	Kulli 2500-2000 BC	2250	10	Fairservis 1975 p207
India, Pakistan, Afghanistan	Pakistan	Niai Buthi	Kulli NBII 1790 BC	1790	1.25	Fairservis 1975 p 182
India, Pakistan, Afghanistan	Punjab	Kanganwal	Harappan (Mature)	1900	0.5	Hegde, KTM and VH Sonawane, (1986), PAGE 31
India, Pakistan, Afghanistan	Punjab	Kotla Nihang Khan	Harappan (Mature)	1900	2.6	Indian Archaeology, A Review (1965-66): 14-6
India, Pakistan, Afghanistan	Punjab	Bara	Harappan (Mature)	1900	16.5	Mughal, M. Rafique, (1997), 42, 47
India, Pakistan, Afghanistan	Rajasthan	Ahmad Khan Dheri	Harappan (Mature)	1900	2.1	Mughal, M. Rafique, (1972), 147
India, Pakistan, Afghanistan	Rajasthan	Mashula	Harappan (Mature)	1900	5.9	Halim, M.A. (1971) Pakistan Archaeology 7:23-89.
India, Pakistan, Afghanistan	Takhar	Shortughai	Harappan (Mature)	2300	n/a	Joshi, Jagat Pati, Madhu Bala and Jassu Ram, (1984),
India, Pakistan, Afghanistan	Transcaspian Lowlands	Karen Depe		4850	14.17	Mellaart 1975: 219
India, Pakistan, Afghanistan	Transcaspian Lowlands	Yalangach	Namazga II	4500	1.2	Mellaart 1975, p. 223, Chlopin, 1963
India, Pakistan, Afghanistan	Transcaucasia	Shubiveri	Neolithic	4300	0.8	Mellaart 1975: 203, Dzhaparidze & Dzhavarachnishvil
Iran & Iraq	Iran	Ganj Dareh Level E	PPNA	8450	0.28	Mellaart 1975: 76, Smith 1968, 1970, 1972
Iran & Iraq	Iran	Ganj Dareh	Period 2	8050	0.1	Aurenche, Paleorient 7(1) 1981 p 94
Iran & Iraq	Iran	Ali Kosh		7250	1.425	Mellaart 1975 p 74
Iran & Iraq	Iran	Ganj Dareh		7000	1	Redman C The Rise of Civilization p 169
Iran & Iraq	Iran	Q'al at Jarmo (Levels 1-5)		6250	1.4	Mellaart 1975: 80, Braidwood & Howe, 1960

Iran & Iraq	Iran	Tepe Tula'I	6200-5900 BC	6050	3.54	Hole 1974 Paleorient 2/2. P.222
Iran & Iraq	Iran	Tepe Guran		6000	0.9	Oates in Friedman & Rowlands
Iran & Iraq	Iran	Tepe Zagheh	6 M BC	5500	1.5	Shahmirzadi p. 49
Iran & Iraq	Iran	Siyalk		5500	3.2	Mellaart 1975: 187, Ghirshman 1938
Iran & Iraq	Iran	Tepe Sabz	Del Luran	5380	1.68	Mellaart 1975 p 172
Iran & Iraq	Iran	Tappeh Cena		5350	1.1	Mortensen 1973, p 36
Iran & Iraq	Iran	Dashliji Depe	early 5 M BC	4850	0.47	Mellaart 1975: 219
Iran & Iraq	Iran	Tepe Ashrafabad	Mehmeh Phase	4750	0.39	Hole, Flanner & Neely, Deh Luran Plain, 73
Iran & Iraq	Iraq	Zarzi	Zarzian	13000	0.0073	Wahida G P of PS 47, 1981
Iran & Iraq	Iraq	Ishkaft Barak	Zarzian	12500	0.0096	Braidwood & Hare, p 29
Iran & Iraq	Iraq	Karim Shahir		9000	0.4	Oates in Friedman & Rowlands
Iran & Iraq	Iraq	Zawi Chemi Shanidar		8900	5	Oates in Friedman & Rowlands
Iran & Iraq	Iraq	Zawi Chemi	Period 1, 2	8785	5.9	Mellaart, 1975: 72, Aurenche, Paleorient 7(1) 1981 p 9
Iran & Iraq	Iraq	Tamerkhan	Jarmo	7000	1.2	Oates, 1977, Sumer XXII 1 & 2 p 52
Iran & Iraq	Iraq	Umm Dabaghiyah	7 Mill BC	6500	1.5	Kirkbride 1975
Iran & Iraq	Iraq	Jarmo		6500	1.5	Flannery, MSU p 41, Redman (R of C) p 165
Iran & Iraq	Iraq	Maghzaliya	Period 4	6300	0.4	Aurenche, Paleorient 7(1) 1981 p 94
Iran & Iraq	Iraq	Matarrah	Hassuna	6250	3.48	Braidwood et al JNES XI 1, 1952
Iran & Iraq	Iraq	Umm Dabaghiyah	First half 6 M BC	5750	0.85	Mellaart 1975, 135, Kirkbride, 1972-1974
Iran & Iraq	Iraq	Yarim Tepe II	Halafian	5700	1.4	Oates, 1978, Oates, Friedman & Rowlands
Iran & Iraq	Iraq	Tell-es-Sawnan	Samarra	5600	2.42	Mellart, 1975, Braidwood et al 1944
Iran & Iraq	Iraq	Tell El-Khan	Hassuna	5500	0.63	Braidwood & Hare, Pre. Inv. In Kurdistan, p. 25
Iran & Iraq	Iraq	Gird Ali Agha	Hassuna	5500	0.63	Braidwood & Howe, Pre. Inv. In Kurdistan, p. 26
Iran & Iraq	Iraq	Matarrah		5500	2	Flannery MSU p. 41
Iran & Iraq	Iraq	Yarim Tepe I	Hassuna	5500	2	Oates, Friedman & Rowlands
Iran & Iraq	Iraq	Hassuna	Hassuna	5500	3	Mellaart 1975: 146
Iran & Iraq	Iraq	Choga Mami		5250	3.5	Oates in Friedman & Rowlands
Iran & Iraq	Iraq	Tell El'Oueili	Ubaid	5100	3.1	Huot 1980 p 207
Iran & Iraq	Iraq	Choga Mami		5000	5.5	Oates in Friedman & Rowlands
Iran & Iraq	Iraq	Tell Rashid	early 5 M BC	4850	0.16	Jasim, Paleorient 9(1) 1983
Iran & Iraq	Iraq	Uqair	5 M BC	4500	11	Oates in Friedman & Rowlands
Iran & Iraq	Iraq	Eridu	End Ubaid	4450	10	Griffith & thomas 1981 p 7
Iran & Iraq	Iraw	Ubaid		5057	1	Archaeology 25, 1972, 264-9, Artibux Asiae XXXIII 19
Iran & Iraq	Mesopotamia	Ras Al'Amiya	Haji Muhammad-Early Ubaid	6000	2.28	Stronach 1960, p 95, 99
Iran & Iraq	Mesopotamia	Ras Al'Amiya	Late Haji Muhammad-Early Ubaid	5900	2.22	Stronach 1960, Iraq XXII-III

Israel, Jordan, Syria	Israel	Ramat Matred IV	Upper Palaeolithic	20000	0.0025	Goring-Morris & Gilead, 1981, IEJ 31 (1-2) p 133
Israel, Jordan, Syria	Israel	J412 (Jebel Humeima)	Upper Palaeolithic	17500	0.05	Henry, D. 1982, JFA 9(4), 427
Israel, Jordan, Syria	Israel	J 403 Jebel Qalkha	Upper Palaeolithic	17500	0.18	Henry, D. 1982, JFA 9(4), 427
Israel, Jordan, Syria	Israel	Fazael III B	Kebaran	16500	0.0045	Goring-Morris 1980 p 57-8
Israel, Jordan, Syria	Israel	J405	Qalkan	16000	0.0125	Henry, D. 1982, JFA 9(4), 432
Israel, Jordan, Syria	Israel	J406b	Qalkan	16000	0.0125	Henry, D. 1982, JFA 9(4), 432
Israel, Jordan, Syria	Israel	J407	Qalkan	16000	0.0125	Henry, D. 1982, JFA 9(4), 432
Israel, Jordan, Syria	Israel	Kefar Darom 8	Kebaran	15500	0.03	Bar-Yosef, Prehistoire du Levant, p. 395
Israel, Jordan, Syria	Israel	Ramat Matred III	Epipalaeolithic	14400	0.007	Goring-Morris & Gilead, 1981, IEJ 31 (1-2) p 133
Israel, Jordan, Syria	Israel	Kebara B	Kebaran	14400	0.02	Garrod D. PPS, XX, 1954
Israel, Jordan, Syria	Israel	Fazael III A	Kebaran	13750	0.00875	Goring-Morris 1980 p66
Israel, Jordan, Syria	Israel	Ein Gev I	Kebaran	13750	0.0125	Bar-Yosef, Prehistoire du Levant: p 395
Israel, Jordan, Syria	Israel	J26	Early Hamran	13750	0.02	Henry, D. 1982, JFA 9(4), 432
Israel, Jordan, Syria	Israel	J201 Layer C	Early Hamran	13750	0.04	Henry, D. 1982, JFA 9(4), 432
Israel, Jordan, Syria	Israel	J504	Early Hamran	13750	0.06	Henry, D. 1982, JFA 9(4), 432
Israel, Jordan, Syria	Israel	Hefziba	Epipalaeolithic	12500	0.14	A. Ronen et al 1975 Quartar v. 26 p 54
Israel, Jordan, Syria	Israel	J31	Middle Hamran	12250	0.012	Henry, D. 1982, JFA 9(4), 434
Israel, Jordan, Syria	Israel	J201 Layer B	Middle Hamran	12250	0.05	Henry, D. 1982, JFA 9(4), 434
Israel, Jordan, Syria	Israel	J203 Lower Level	Middle Hamran	12250	0.05	Henry, D. 1982, JFA 9(4), 433-4
Israel, Jordan, Syria	Israel	Neve David	Geometric Kebaran	11900	0.1	Kaufman 1992 J. Med Arch 5(2) p 185
Israel, Jordan, Syria	Israel	Ohalo II	Geometric Kebaran	11900	0.15	Kaufman 1992 J. Med Arch 5(2) p 185
Israel, Jordan, Syria	Israel	Hefziba	Geometric Kebaran	11900	0.15	Kaufman 1992 J. Med Arch 5(2) p 185
Israel, Jordan, Syria	Israel	J202 Lower Level	Late Hamran	11500	0.05	Henry, D. 1982, JFA 9(4), 436
Israel, Jordan, Syria	Israel	J203 Upper Level	Late Hamran	11500	0.05	Henry, D. 1982, JFA 9(4), 436
Israel, Jordan, Syria	Israel	Site M 190 Ramat Matred	Prob. Negev Kebaran	11000	0.004	Yizraeli, T., P.E.Q. 1967: 79
Israel, Jordan, Syria	Israel	Site M 141 Ramat Matred	Prob.Negev Kebaran	11000	0.004	Yizraeli, T., P.E.Q. 1967: 79
Israel, Jordan, Syria	Israel	J202 Upper Level	Final Hamran	11000	0.045	Henry, D. 1982, JFA 9(4), 437
Israel, Jordan, Syria	Israel	Jericho	Proto Neolithic	10750	3	Roaf 1990
Israel, Jordan, Syria	Israel	Fazael VI	Early Natufican	10400	0.04	Goring-Morris 1980 p104, 8
Israel, Jordan, Syria	Israel	Tor Abu SIF	Natufian	9650	0.005	Bar-Yosef 1970, Henry 1973, Hassan 1981
Israel, Jordan, Syria	Israel	Ala Safat	Natufian	9650	0.005	Bar-Josef 1970
Israel, Jordan, Syria	Israel	Erq el Ahmar A2	Natufian	9650	0.0075	Bar-Yosef 1970, Henry 1973, Hassan 1981
Israel, Jordan, Syria	Israel	Salibiya XII	Natufian	9650	0.0125	Goring-Morris, 1980 p 10, 104
Israel, Jordan, Syria	Israel	Kebara B	Natufian	9650	0.02	Bar-Yosef 1970, Henry 1973, Hassan 1981
Israel, Jordan, Syria	Israel	El-Wad BI	Natufian	9650	0.025	Bar-Yosef 1970, Henry 1973, Hassan 1981

Israel, Jordan, Syria	Israel	El-Wad B2	Natufian	9650	0.035	Bar-Yosef 1970, Henry 1973, Hassan 1981
Israel, Jordan, Syria	Israel	Hayonim Cave	Natufian	9650	0.06	Shewan 2004
Israel, Jordan, Syria	Israel	El Wad Cave	Natufian	9650	0.055	Shewan 2004
Israel, Jordan, Syria	Israel	Kebara Cave	Natufian	9650	0.052	Shewan 2004
Israel, Jordan, Syria	Israel	Rosh Zin	Natufian	9650	0.085	
Israel, Jordan, Syria	Israel	Hayonim Terrace	Natufian	9650	0.125	Bar-Yosef 1970, Henry 1973, Hassan 1981
Israel, Jordan, Syria	Israel	Eynan	Natufian	9650	0.25	Bar-Yosef 1970, Henry 1973, Hassan 1981
Israel, Jordan, Syria	Israel	Rosh Horesha	Natufian	9650	0.7	Bar-Josef 1970
Israel, Jordan, Syria	Israel	Ain Mallaha	Natufian	9650	0.22	Shewan 2004
Israel, Jordan, Syria	Israel	Shanidar Cave	Aurenche Period 1	9150	0.12	Sumer XVII, 1961 p 71
Israel, Jordan, Syria	Israel	Fazael IV	Late Natufian	8750	0.0225	Goring-Morris 1980 p104, 7
Israel, Jordan, Syria	Israel	Salibiya I	Late Natufian	8750	0.05	Goring-Morris, 1980 p 10
Israel, Jordan, Syria	Israel	G VIII (Har-Harif area)	Harifian	8650	0.06	Goring-Morris & Gopher, IEJ 31 (1-2), p 133-134
Israel, Jordan, Syria	Israel	Ain Mallaha	PPNB Period 1	7500	0.2	Aurenche, Paleorient 7(1) 1981 p 94
Israel, Jordan, Syria	Israel	Waddi Jibba I	PPN	7250	0.015	Bar-Yosef 1981, p. 10
Israel, Jordan, Syria	Israel	Ramat Matred V	PPN	7250	0.1	Goring-Morris & Gilead, 1981, IEJ 31 (1-2) p 133
Israel, Jordan, Syria	Israel	Ramat Matred VI	PPN	7250	0.1	Goring-Morris & Gilead, 1981, IEJ 31 (1-2) p 133
Israel, Jordan, Syria	Israel	Wadi Tbeik	PPNB	6800	0.025	Bar-Yosef 1981, p. 10
Israel, Jordan, Syria	Israel	ED22D17	PPNB	6800	0.6	Servello, The Levantine Pre-Pottery Neolithic p 86
Israel, Jordan, Syria	Israel	Jaffa Dunes	PPNB	6800	2.4	Mallon, 1925, MUSJ X (6), 201
Israel, Jordan, Syria	Israel	Poleg 18N	PPN	6800	7.25	Servello A. The levantine Pre Pottery neolithic, p. 71
Israel, Jordan, Syria	Israel	Beisamoun	PPNB	6800	8.15	Lechevallier M ,1978, 129
Israel, Jordan, Syria	Israel	Yiftahel 1982	PPNB	6500	3.14	Lamdan, M 1983, I.E.J. 33 (3-4), p 259
Israel, Jordan, Syria	Israel	Sefunim Cave	Neolithic	4500	0.08	Ronen, a., Quartar 19, 1968, p. 276
Israel, Jordan, Syria	Israel	Kh. Kharrubba	Neolithic	4500	3.5	Prausnitz, IEJ v. 9 1959, p. 168
Israel, Jordan, Syria	Israel	Kh. Kharrubba Area b)B	Neolithic	4500	5.3	Prausnitz, IEJ v. 9 1959, p. 168
Israel, Jordan, Syria	Israel	Kh. Kharrubba area (a)	Neolithic	4500	7.2	Prausnitz, IEJ v. 9 1959, p. 168
Israel, Jordan, Syria	Israel	Beer Resisim		1100	0.59	Cohen & Dever, B.A.S.O.R. No. 236, 1979
Israel, Jordan, Syria	Israel, Negev	Abu Salem	Harifian	8650	0.075	Gopher & Goring-Morris, B.A.S.O.R. 1998 p 314
Israel, Jordan, Syria	Israel, Negev	Abu Salem	PPNB	6800	0.0125	Gopher & Goring-Morris, B.A.S.O.R. 1998 p 314
Israel, Jordan, Syria	Jordan	Uweinid 7	Middle Palaeolithic	20000	0.5	Garrard & Stanley Price Paleorient v. 3 p 119
Israel, Jordan, Syria	Jordan	Wadi el-Jilat 9	Upper Palaeolithic	20000	0.71	Garrard et al n.d.
Israel, Jordan, Syria	Jordan	Azraq 20	Kebaran	15250	0.2	Garrard & Stanley Price p 119
Israel, Jordan, Syria	Jordan	Wadi el-Jilat 10	Epipalaeolithic	14790	1.3	Garrard et al n.d.
Israel, Jordan, Syria	Jordan	Wadi el-Jilat 9	Upper/Epi Palaeolithic	13000	0.84	Levant 1985, Garrard et al n.d. p12

Israel, Jordan, Syria	Jordan	Site 1062 Wadi el-Hasa	Upper Palaeolithic	13000	3.5	MacDonald et al 1983 ADAJ XXVII, 315
Israel, Jordan, Syria	Jordan	Khanna 6	Epipalaeolithic	12900	0.2	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Jordan	Khanna 2	Epipalaeolithic	12900	0.5	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Jordan	Khanna 5	Epipalaeolithic	12900	0.5	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Jordan	Kharaneh IV	Geometric Kebaran	12400	2.17	Muheisen 1983, p. 89
Israel, Jordan, Syria	Jordan	Wadi El-Jilat 6	Later Epi-Palaeolithic	12250	0.6	Garrard et al Levant 1985 p 19
Israel, Jordan, Syria	Jordan	Wadi el-Jilat 8	Epipalaeolithic	11310	0.64	Garrard et al n.d.
Israel, Jordan, Syria	Jordan	al-Sunah I	Early Natufican	9900	1.2	Gebel H-G, 1985 TAVO
Israel, Jordan, Syria	Jordan	Site 895 Wadi el-Hasa	Natufian	9650	0.05	MacDonald et al ADAJ XXVII, 1983, pp 311-323
Israel, Jordan, Syria	Jordan	Azraq 18	Natufian	9650	0.14	Shewan 2004
Israel, Jordan, Syria	Jordan	Wadi Hammeh 27	Natufian	9650	0.4	Shewan 2004
Israel, Jordan, Syria	Jordan	Khanna 4	Natufian	9650	0.5	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Jordan	Kharaneh IV	Natufian	9650	0.55	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Jordan	Uweinid 6	Natufian	9650	1.9	Garrard & Stanley Price p 119
Israel, Jordan, Syria	Jordan	Ain Rahub	Late Natufian	8750	0.16	Gebel H-G & Mhuehisen, 1985 unpub.
Israel, Jordan, Syria	Jordan	Netiv Hagdud	PPNA	8000	1.04	Bar-Yosef et al 1980: 202
Israel, Jordan, Syria	Jordan	Khanna 2	PPN	7250	0.5	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Jordan	Khanna 4	PPN	7250	0.5	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Jordan	Kharaneh IV	PPN	7250	0.55	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Jordan	Uweinid 3	PPN	7250	1.9	Garrard & Stanley Price p 119
Israel, Jordan, Syria	Jordan	Site 1008 Wadi el-Hasa	PPNA-PPNB	7250	1.5	MacDonald et al 1983 ADAJ XXVII, 311-323
Israel, Jordan, Syria	Jordan	Wadi el-Jilat 12	? Neolithic	7250	1.2	Levant 1985, Garrard et al n.d. p17
Israel, Jordan, Syria	Jordan	Wadi Fidan	Neolithic	7250	2.47	Raikes, T. 1980, Levant XII p 53
Israel, Jordan, Syria	Jordan	Shaqarat M'siad	Period 3	7100	1.7	Aurenche, Paleorient 7(1) 1981 p 94
Israel, Jordan, Syria	Jordan	Wadi el-Jilat 22	? PPNB	6800	0.6	Levant 1985, Garrard et al n.d. p17
Israel, Jordan, Syria	Jordan	Site 1007 Wadi el-Hasa	PPNB	6800	1.5	MacDonald et al 1983 ADAJ XXVII, 311-323
Israel, Jordan, Syria	Jordan	Ain Ghazal	PPNB	6800	9.75	Rollefson, G. 1983 Paleorient 29
Israel, Jordan, Syria	Jordan	Wadi el-Jilat 7	PPNB	6650	0.22	Garrard et al n.d.
Israel, Jordan, Syria	Jordan	Beidha		6600	0.4	Oates in Friedman & Rowlands
Israel, Jordan, Syria	Jordan	Abu Barqa	Late PPNB	6550	2	Gebel H-G, 1985 TAVO
Israel, Jordan, Syria	Jordan	Azraq 31	PPNB	6500	0.56	Garrard et al Levant 1985 p 18
Israel, Jordan, Syria	Jordan	Kharaneh I	Neolithic	6400	3	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Jordan	Adh Dhaman	PPNB Period 3	6250	1	Aurenche, Paleorient 7(1) 1981 p 94
Israel, Jordan, Syria	Jordan	Ain Abu Nekheileh	PPNB	6100	0.2	Kirkbride D The Neolithic in Wadi Rumm p 2
Israel, Jordan, Syria	Jordan	Kharaneh 7	Pottery Neolithic	4500	0.5	Garrard & Stanley Price p. 119

Israel, Jordan, Syria	Jordan	Hisma	Neolithic/Chalcolithic	4500	0.35	Stanley-Price & Garrard, 1975, ADAJ XX, p. 91
Israel, Jordan, Syria	Jordan	Kharaneh 2	Pottery Neolithic	4500	1.9	Garrard & Stanley Price p. 119
Israel, Jordan, Syria	Palestine	Jericho	Natufian	9650	0.09	RJF
Israel, Jordan, Syria	Palestine	Jericho	PPNA	7850	4.04	Aurenche, Paleorient 7(1) 1981 p 94
Israel, Jordan, Syria	Palestine	Jericho	Period 3	7100	2.5	Aurenche, Paleorient 7(1) 1981 p 94
Israel, Jordan, Syria	Palestine	Jericho	PPNB	6800	4	Redman (R. of C.) p 151
Israel, Jordan, Syria	Syria	Yabrud III	Levantine Aurignacian/Natufian	19250	0.005	Rust, Die Hohlenfunde von Jabrud, p 100
Israel, Jordan, Syria	Syria	Cayonu		8122	1.01	Campbell, H. Prehistoire due Levant No. 598, 1981
Israel, Jordan, Syria	Syria	Mureybet	Period 2	7950	3.1	Aurenche, Paleorient 7(1) 1981 p 94
Israel, Jordan, Syria	Syria	Dibsi Faraj East	Mesolithic	7500	0.47	Wilkinson & Moore, Levant X 1978
Israel, Jordan, Syria	Syria	Tell Mureybet X-XVIII		7500	3	Flannery MSU p. 41
Israel, Jordan, Syria	Syria	Cayonu	PPNB	7150	4.9	Mellaart 1975: 52
Israel, Jordan, Syria	Syria	Tell Abu Hureya	7th M. BC	6500	12.1	Moore 1979 p. 55, 58
Israel, Jordan, Syria	Syria	Tell Abu Hureya	PPNB	6400	15	Mellaart 1975: 48
Israel, Jordan, Syria	Syria	Bouquras		6150	2.07	Akkermans et al Prehistorie du Levant No. 598, fig. 5
Israel, Jordan, Syria	Syria	Tell Abu Hureya		6000	11.5	Schmandt-Besserat, Expedition Sprin 1977 p. 35
Israel, Jordan, Syria	Syria	Shams ed-Din Tannira	Halafian	5950	3.8	Al-Radi & Seedon, 1980, Berytus XXVIII, p 116
Israel, Jordan, Syria	Syria	Tell Abu Hureya	6th M BC	5500	6.07	Moore 1979 p. 58
Israel, Jordan, Syria	Syria	Shams ed-Din Tannira	Halafian	4500	2.5	Al-Radi & Seedon, 1980, Berytus XXVIII, p 101
Mesoamerica	Guatemala	58-02-344	Middle Formative	850	2	Michels 1979 p 86
Mesoamerica	Mexico	Martinez Rock Shelter	Preceramic	5450	0.009	Flannery & Marcus, 1983, p25
Mesoamerica	Mexico	Gheo-Shih		4500	1.5	Sabloff (ed) 1981 Middle American Indians p 59, 62
Mesoamerica	Mexico	Cueva Blanca		3047	0.016	Flannery & Marcus, 1983, p22
Mesoamerica	Mexico	IX EF 3	Early Formative	1400	4	Blanton 1972 p 39
Mesoamerica	Mexico	Tierras Largas		1350	1.58	Flannery 1978
Mesoamerica	Mexico	Tierras Largas		1225	2.24	Flannery 1978
Mesoamerica	Mexico	IX MF 1	Early-middle Formative	1200	9	Blanton 1972 p 40
Mesoamerica	Mexico	Tierras Largas		1150	0.5	Flannery in MSU
Mesoamerica	Mexico	Tierras Largas		1075	0.95	Flannery 1978
Mesoamerica	Mexico	IX MF 2	Early-middle Formative	1025	3	Blanton 1972 p 40a
Mesoamerica	Mexico	IX MF 3	Early-middle Formative	1025	4	Blanton 1972 p 41
Mesoamerica	Mexico	Potrero Nuevo	Early F.	1025	4.6	Flannery 1976
Mesoamerica	Mexico	Ayotia	Early-middle Formative	1025	9	Sanders, Flannery 1978 p 80
Mesoamerica	Mexico	Tierras Largas		925	1.59	Flannery 1978
Mesoamerica	Mexico	IX MF 4	Middle Formative	850	12.5	Sanders, Flannery 1978 p 80

Mesoamerica	Mexico	Tierras Largas		650	3	Flannery 1978
Mesoamerica	Mexico	Cuicuilco		475	0.75	Sanders p 97
Mesoamerica	Mexico	El Arbolillo		200	10	?Flannery & Marcus 1983
Mesoamerica	Mexico Mixtec	Yuzanu		2050	0.0028	Flanner & Marcus 1983 p 25-6
Mesoamerica	Mexico Oaxaca	Gheo-Shih		7640	1.5	F.A.M.S. website 25-10-06
Mesoamerica	Mexico Oaxaca	San Jose Mogote	Late T.L.	1225	2.5	Flannery 1978
Mesoamerica	Mexico Oaxaca	San Jose Mogote		1150	0.85	Flannery & Marcus 1983
Mesoamerica	Mexico Oaxaca	San Jose Mogote		1150	1.5	Flannery in MSU
Mesoamerica	Mexico Oaxaca	San Jose Phase	San Jose Phase	1000	1.05	Flannery & Marcus 1983 p 51
Mesoamerica	Mexico Oaxaca	San Sebastian Abasolo	San Jose Phase	1000	1.5	Flannery & Marcus 1983 p 67
Mesoamerica	Mexico Oaxaca	San Jose Mogote	San Jose Phase	1000	45	Flannery & Marcus 1983 p 51
Mesoamerica	Mexico Oaxaca	San Jose Mogote	Late San Jose Phase	925	20	Flannery 1978
Mesoamerica	Mexico Oaxaca	San Jose Mogote		900	15.9	Flannery 1978
Mesoamerica	Mexico Oaxaca	Barrio Del Rosario Huitzo	Guadalupe Phase	700	2.7	Flannery & Marcus 1983 p 53
Mesoamerica	Mexico Oaxaca	Monte Negro	M A I	649	0.91	Flannery & Marcus 1983 pp 99-100
Mesoamerica	Mexico Oaxaca	San Jose Mogote		550	45	
Mesoamerica	Mexico W. Coast	Nayarit	Matanchei Complex	2000	0.3	Weaver 1981 p 57
N. America	Aleutian Islands	Anangula		6500	6.2	Aigner, J. in Quartar, 1977 (v 27/28) p. 68
N. America	Aleutian Islands	Anangula		5990	3.2	McCartney & Turner, Arctic Anthr. 1960, 111-2, p29
North Africa	Algeria	Aterian	Wadi Jebbana (Bir al Ater)	20000	0.3905	Balout, L. Prehistoire de l'Afrique du Nord p 279
North Africa	Algeria	Wadi Tiguiguest	Iberomaurusian	11500	0.018	Cadenat P 1958 Libyca VI p 26
North Africa	Algeria	La Smala-Ferme	Iberomaurusian	11500	0.078	Caderat, P. 1966, B.S.P.F. 63, p. 643
North Africa	Algeria	Cubitus	Capsian	6000	0.047	Caderat, P. 1963, in Libyca, X1: 75-122
North Africa	Algeria	Bekkeria	Capsian	6000	0.07	Le Du, R. 1953, Lybica, p. 144-155
North Africa	Algeria	Ouled Djellal	Capsian	6000	0.23	Grebenart, D. 1967, Congres Panafricain de prehistoir
North Africa	Algeria	Mechta el-Arbi	Capsian	6000	0.35	Balout, Prehistoire de L'Afrique du Nord, 397
North Africa	Algeria	Ain M'lila	Capsian	6000	0.565	Balout, Prehistoire de L'Afrique du Nord, 397
North Africa	Algeria	Site 51 (Tarf Region)	Capsian	6000	0.71	Ramendo, L. 1961 Libyca IX, 81-100
North Africa	Algeria	El-Mermouta	Capsian	6000	0.79	Grebenart, D. 1967, Congres Panafricain de prehistoir
North Africa	Algeria	Douar Beida Bordj	Upper Capsian	5500	0.39	Vrguet M 1955 Libyca III 66-67
North Africa	Egypt	Various Nile Valley sites		14000	0.2	Marks 1968, Mellars 1981
North Africa	Egypt	Isnan Industry Site (a)		11000	1.3	Marks 1968, Hassan 1981
North Africa	Egypt	Isnan Industry Site (b)		11000	1.54	Marks 1968, Hassan 1981
North Africa	Egypt	Wadi ed-Deir (1 of 4 sites)	PPN	7250	0.0055	Bar-Yosef, 1981 p 11

North Africa	Egypt	Wadi ed-Deir (1 of 4 sites)	PPN	7250	0.0055	Bar-Yosef, 1981 p 11
North Africa	Egypt	Wadi ed-Deir (1 of 4 sites)	PPN	7250	0.0055	Bar-Yosef, 1981 p 11
North Africa	Egypt	Wadi ed-Deir (1 of 4 sites)	PPN	7250	0.025	Bar-Yosef, 1981 p 11
North Africa	Egypt	Merimde	Predynastic	4500	17	Hayes, JNES XXIII (4) 1964, p 229
North Africa	Egypt	Mahasna	Predynastic	4300	0.071	Hassan 1980 p 443 and others
North Africa	Egypt	Armant	Predynastic	4300	0.0716	Hassan 1980 p 443, Mond & Myers 1937
North Africa	Egypt	Hamamiya	Predynastic	4300	0.2	Masson 1980 p 443
North Africa	Egypt	Nagada	Predynastic	4300	5	Hassan 1980 p 443 and others
North Africa	Egypt	Maadi	Predynastic	3300	18	Hassan 1980 p 443 and others
North Africa	Egypt	Maadi	Djet end of 1st Dynasty	3050	0.3	Kaiser and Digitiser
North Africa	Egypt	Kahun	Middle Kingdom	1840	11	Kemp 1977 p 194
North Africa	Egypt	Abydos	Middle Kingdom	1840	17.5	Kemp 1977 p 139
North Africa	Egypt	El Kab	New Kingdom	1310	13	Pers Comm Hoffman, JEA 1921 plate X
North Africa	Morocco	Taforalt	Aterian	20000	0.06	Roche, J. 1967, Congres Panafricain de prehistoire 102
North Africa	Morocco	Taforalt	Iberomaurusian	11550	0.06	Roche, J. 1967, Congres Panafricain de prehistoire 102
North Africa	Nubia	Khormusan Industry Site (a)		20000	0.7	Marks 1968, Hassan 1981
North Africa	Nubia	Khormusan Industry Site (b)		20000	0.9	Marks 1968, Hassan 1981
North Africa	Nubia	Afh-1	A Group	4510	0.15	Le Caire, Fouilles en Nubie
North Africa	Nubia	FG 10/1/71 Nubia	Neolithic	4050	0.1	A Vica La Prosp. Arch. De la Vallee du Nil au Sud 1976
North Africa	Nubia	FG 14/1/71 Nubia	Neolithic	4050	0.15	A Vica La Prosp. Arch. De la Vallee du Nil au Sud. 1976
North Africa	Nubia	FG 9/1/71 Nubia	Neolithic	4050	1.1	A Vica La Prosp. Arch. De la Vallee du Nil au Sud 1976
North Africa	Nubia	FG 3/1/71 Nubia	Neolithic	4050	4	A Vica La Prosp. Arch. De la Vallee du Nil au Sud 1976
North Africa	Nubia	Es Shaeinab	Neolithic	4000	0.56	Clark MSU p 133
North Africa	Sahara	Adrar Bous (1 site)	Pre 3800 BC	4000	0.36	Clark MSU p 132
North Africa	Sahara	Adrar Bous (2nd site)	Pre 3800 BC	4000	0.36	Clark MSU p 132
North Africa	Sahara	Adrar Bous		3250	2.5	Clark MSU p 132
North Africa	Sahara	Meniet Site II		3145	17.5	Clark MSU p 132
North Africa	Sahara	Amekni		1200	0.0054	Clark MSU p 132
North Africa	Sudan	Kadero 1		5030	2.6	Haland R Norwegian Arch Rev 1981 14(1) p 48
North Africa	Sudan	Um Direiwa 1		4950	0.55	Haland R Norwegian Arch Rev 1981 14(1) p 49
South America	Peru	Paloma		4250	15	Morris & von Hager 1993 p 33
South America	Peru	Encanto		3600	2	Mosely p 20
South America	Peru	Huaca el Pulpar de	Base Period	3000	0.2	Mosely in Willey Paper 1964 p 14

		Chicama				
South America	Peru	Huaca Prieta		2710	0.625	Engel (S-C) p 73, Mosely in Willey Paper 1964 p 14
South America	Peru	Pampa		2500	0.28	Moseley 1975 p 22
South America	Peru	Asperco		2400	12	Morris & von Hager 1993 p 46
South America	Peru	Alto Salaverry		2150	1.7	Pozarski WA Vol 11 No. 2 p 164
South America	Peru	La Florida		1750	12	Morris & von Hager 1993 p 37-38
South America	Peru	El Paraiso		1650	6.3	Willey vol 2 p 97
South America	Peru	Asia		1525	0.032	Engel (S-C) p 71
South America	Peru	PV48-339b	Early Horizon.? Pre 1200 BC	1250	0.2	Scheele 1970 p 206
South America	Peru	PV48-349	Early Horizon.? Pre 1200 BC	1250	0.5	Scheele 1970 p 201
South America	Peru	PV 48-98 Malpaso	Early Horizon.? Pre 1200 BC	1250	1.9	Scheele 1970 p 190
South America	Peru	Garagay		1050	9	Morris & von Hager 1993 p 47
South America	Peru	Gramalotte		1000	1.6	Pozarski WA Vol 11 No. 2 p 173
South America	Peru	Cardal		975	20	Morris & von Hager 1993 p 47
South America	Peru	Punkuri	Early Horizon	900	0.2	Proulx 1976 p 6
South America	Peru	Sechin Alto	Chavin	900	7.5	Burger 1975 p 366
South America	Peru	PV 47-39	Early Horizon	850	0.48	Scheele 1970 p 221
South America	Peru	Chavin		550	0.021	Willey Vol 2 p.116
South America	Peru	PV 46-26	Early Horizon Afte 500 BC	450	0.02	Scheele 1970 p 229
South America	Peru	PV 45-117	Early Horizon Afte 500 BC	450	0.15	Scheele 1970 p 229
South America	Peru	PV 45-125	Early Horizon Afte 500 BC	450	0.5	Scheele 1970 p 229
South America	Peru	PV 46-10	Early Horizon Afte 500 BC	450	1	Scheele 1970 p 117
South America	Peru	PV 46-121	Early Horizon Afte 500 BC	450	3	Scheele 1970 p 220
South America	Peru	La Cantina	Late Formative	0	2.7	Thompson 1974 p 15