13

SETTLEMENT AND TERRITORY

John Bintliff

INTRODUCTION

In 1970 Vita-Finzi and Higgs published a challenging and entirely novel proposition for the archaeological community; namely, that human communities throughout history and prehistory practised territorial behaviour in regard to their exploitation of landscapes. We were thereby offered an exciting new methodology for research in the delineation and analysis of such territories – Catchment Analysis (Vita-Finzi and Higgs 1970). Throughout the 1970s, many scholars adopted the technique in widely separated countries around the world, not least a generation of researchers based in the home of this 'palaeoeconomy' approach, Cambridge University. However, during the 1980s and into the early 1990s only limited publications have appeared in which territorial theory has been employed by archaeologists, despite a continual growth in interest amongst cultural anthropologists. The reasons for the limited success of the approach are varied, but can broadly be ascribed to philosophical and technical difficulties.

During the late 1960s and the early 1970s, archaeology in the West was revitalized in both practice and theory by the impact of New or Processual Archaeology, associated with a proliferation of new ideas and methods. Challenging approaches from ecology were just one strand in this burgeoning of new concepts (Clarke 1972: 6–7, 46–47). By the early 1980s, however, there had occurred a critical redirection of archaeological theory away from processualism into structuralism (Hodder 1982b) and later forms of post-processualism (Hodder 1986). In contrast to the development of theory in related disciplines with a far larger research community such as geography, history and social anthropology, new directions in archaeological theory during this century appear to be associated with the displacement and rejection of earlier theoretical systems, rather than with the cumulative growth of a spectrum of complementary or alternative approaches (Bintliff 1986).

Central to post-processualism is philosophical idealism, which diverts research attention from forms of human behaviour shared with the rest of the animal kingdom towards a supposedly unique capacity for humans to create the world around them. This, some critics say, takes the study of human communities in the direction of an anthropocentrism which is pre-Freud, pre-Darwin and even pre-Galileo. Effectively it has certainly taken human ecology as a variant of general ecology out of the attention of most archaeologists, although contemporary concern about the Earth's resources and our future as an element in world ecology are at a high level of public awareness. In fact this shift towards idealism in archaeological theory and that of all other human-centred disciplines has far more to do with contemporary economics than world ecology (Bintliff 1991, 1993, 1995).

If it can be argued that ecological approaches, especially Catchment Analysis, have been neglected in archaeology for a priori reasons since the later 1970s, we can also identify intrinsic, technical, problems which have prevented a wider recognition of the major potential of such a methodology and hindered its general acceptance as a tool of settlement archaeology. Fundamentally, it must be admitted that after the pioneer paper by Vita-Finzi and Higgs, only limited modifications were made to the theory of human territoriality in archaeology, leaving a growing number of weaknesses and criticisms unresolved and even unanswered by its practitioners.

It is not the purpose of this chapter to seek to restore human ecology to its proper role as a major focus of archaeological interest, but it *is* intended that it should resolve outstanding problems with territorial analysis and thereby provide a firm foundation for the latter's general application to ancient settlement systems.

HUMAN TERRITORIES: THE DEVELOPMENT OF A METHODOLOGY AND CRITIQUES

In the initial publications of Site Catchment theory, Vita-Finzi and Higgs and colleagues were able to cite a limited body of observations from ethnography and human geography (such as Chisholm 1962: 73, 142ff.) in support of 'quanta' in human territorial size which could provide the basis for the operation of territorial research in the field. Thus it was suggested that hunter-gatherer settlements might be associated with territories of up to a 10-kilometre radius from the home base, pastoral herder sites with some 7.5-kilometre radius of territory, and farming communities with a 5-kilometre territorial radius. The fundamental explanation for such regularities lay in the related principles of least effort and land rent: as members of a human community travel out into the landscape surrounding their residential base, the work they can accomplish in food procurement declines with increasing distance due to time lost in return travel. With the increased productivity per square kilometre of landscape made possible through the adoption of domestic animals, and even more so through the discovery of cereal cultivation, the large size of hunter-gatherer territories was reduced in societies with a predominantly pastoral and agricultural economy, since smaller areas closer to the settlement both offered equivalent quantities of food and required more intensive labour that could not be diluted through time-consuming travel.

From an admittedly slim number of empirical observations, the Cambridge palaeoeconomy group suggested that a global average of human walking-time of some 5 kilometres an hour would allow archaeologists to set territorial radii for sites in each of the three main economies (hunter-gatherer, pastoral and cereal farmer) at a 2-hour, 1.5-hour and 1-hour distance respectively from the settlement. In practice (Jarman *et al.* 1972), practitioners of catchment analysis had soon realized that map distance for walking-times of 2, 1.5 and 1 hour varied according to physical relief: thus on a completely flat plain without a major river crossing, one might walk as much as 7 kilometres in an hour, whereas in very rugged hill country the same time would find one as little as 2 to 3 kilometres as the crow flies away from the settlement. In most cases the deviation between map distance and walking time is not great, and many case studies have continued to use compass-drawn radii for boundary definition. For detailed work, however, it is clearly advisable that walking-time provides the more exact measure of catchment radii.

Proceeding from the delimitation on a map of these circular boundaries, the catchment analyst would plot the distribution of varying land classes, topographic details, vegetation and water resources within the territory so defined, so as to 'read the mind' of those past settlers who located their residences in order to exploit these particular resources. Not only would one expect to discover that the overall bounded territory was especially favourable for the needs of that past community, but a further consideration of the underlying principle of the friction of distance would suggest that, even within the territory, those resources to be given most attention or demanding most labour would be found closest to the home base. Thus it was predicted that the evaluated contents of the bounded territory would be found to be unusually rich in those resources exploited by the past community, compared with their distribution in the region as a whole (for example, conditions favouring the proliferation of wild plants and animals, grazing opportunities for domestic animals, fertile soil for cultivated crops). Furthermore, following the model of von Thünen, the ancient settlement might have been surrounded by a series of land use zones, up to the territorial boundary, all concentric around the residential focus, with those subsistence activities demanding most labour being practised in the innermost zones, and the least demanding economic activities being carried out in the outermost zones.

A fundamental criticism of territorial analysis takes issue with the central assumption that past human communities have adapted their behaviour to ecological principles, either intuitively or consciously. Confronted with the apparent ethnographic evidence for territoriality, the response has been to cite alternative case studies where human settlements appear irrationally sited for economical use of the landscape, and where 'uniquely human' needs are dominant over ecological pressures (social factors, ritual factors, and so on).

It is certainly the case that territorial analysis deliberately confines its sphere of operation to those past settlements where it is believed that the majority of the inhabitants were concerned with food production from local resources, and excepts sites of an essentially military, cult, industrial, or commercial character. None the less, in the pre-industrial world only a tiny fraction of settlements will not have been predominantly located for exploiting the food resources of their immediate environment, still leaving vast scope for catchment analysis. This criticism is only valid if it can justify the claim that essentially food-producing settlements could be located *without primary concern* for access to areas in the landscape vital for their economy.

Examination of supposedly ecologically irrational settlement systems tends to reveal sound ecological principles. Two examples will suffice. Ian Hodder (Hodder 1982a; Hodder and Orton 1976) cited Jackson's survey of studies on African cultivators, where quite often the village site is surrounded by an extensive zone of the poorest agricultural land, beyond which lies far better soil. In fact a close study of the relevant case studies (Bintliff 1981) revealed that the reason for this situation was prolonged, intense, cultivation of the area closest to these villages in a landscape with naturally poorly developed soils, resulting in soil impoverishment. This society practised a cyclical relocation of villages onto fresh soils when land exhaustion reached a critical level, in a pattern of shifting agriculture. In other words, this example serves rather to reinforce the principles underlying catchment analysis.

A second example concerns the Nuba of the Sudan, whose farming villages lie along very poorly resourced ridges, avoiding fertile valley land below (Hodder 1982c: 127ff.). Essential to our full understanding of this settlement 'preference' is the fact that the valley land has become occupied by a different ethnic group which has driven the indigenous people into marginal hill locations for their livelihood. The ecological archaeologist, provided that his or her dating methods allow the inference that these two settlement systems are contemporary and complementary, will be less concerned with the question of why the hill culture does not occupy the plains, than with understanding how and why the marginal lands sustained settlement by a different cultural group. There is, none the less, a genuine point to learn from here, in that a given community may find itself forced to make a livelihood in a particular environment, rather than having the luxury of an empty landscape and total choice. Military pressure from more powerful cultures is one factor in history;

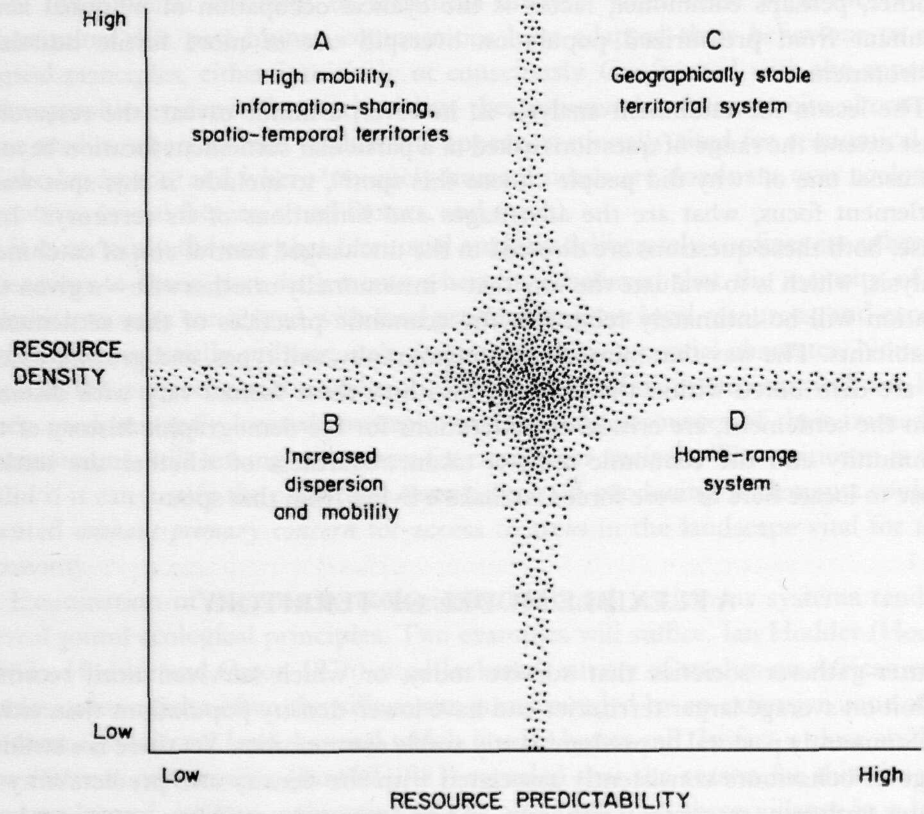
another, perhaps commoner, factor is the cyclical occupation of marginal lands resultant from pressurized population overspill out of more fertile heartland environments.

The lesson for catchment analysis is, however, a minor caveat: the researcher must extend the range of questions asked of a particular settlement location beyond the usual one of 'why did people choose this spot?', to include 'if this spot was a settlement focus, what are the advantages and limitations of its territory?' In a sense, both these questions are directed to the unchanged central aim of catchment analysis, which is to evaluate the way that – intentionally or otherwise – a given site location will be intimately related to the economic practices of that settlement's inhabitants. The way that microclimate, topography, soil types, and grazing potential are distributed within the territory, and how these factors vary with distance from the settlement, are critical considerations for the demographic history of the community and the economic options taken, regardless of whether the settlers chose to locate here or were forced to make a living from that spot.

A FLEXIBLE MODEL OF TERRITORY

Hunter-gatherer societies that survive today, or which survived until recently, exploit on average larger territories and have lower-density populations than either predominantly pastoral or predominantly arable communities. Yet there is a striking range of behaviours consistently associated with the density and predictability of hunter-gatherer resources, although recent research modifies environmental determinism by showing how communities culturally select their range of resources before adapting to the latter's parameters. A minority of hunter-gatherer groups lives in particularly prolific resource zones (for example, the north-west Pacific coast) where food is especially abundant, predictable, and spatially very concentrated: such unusual circumstances overlap with the resource potential available to communities practising herding and farming of small landscapes.

Dyson-Hudson and Smith (1978) argue from a wide range of such examples that the nature, scale, and importance of territory to a human group vary systematically with the properties of key resources available to and/or selected by the group as central to its economy (Fig. 13.1). Where resources are neither concentrated nor very predictable (Mode B), the human group will exhibit little or no systematic territorial behaviour. The group will be very mobile and exploit a very wide and annually or seasonally variable range of landscapes, heading opportunistically for the most favourable resource zones each season. Since the latter will shift across the countryside, characteristic relations with other human groups will be open and unaggressive. There are no 'hot spots' of high resource potential worth laying preferential claim to as a territorial focus, and shared access between groups to a



RELATIONSHIP BETWEEN RESOURCE DISTRIBUTION AND FORAGING STRATEGY.

	Resource Distribution	*Economic Defendability*	*Resource Utilization*	*Degree of Nomadism*
A.	Unpredictable and Dense	Low	Info-sharing	High
B.	Unpredictable and Scarce	Low	Dispersion	Very high
C.	Predictable and Dense	High	Territoriality	Low
D.	Predictable and Scarce	Fairly low	Home ranges	Low-medium

Figure 13.1 Model for the creation of human territoriality. Reproduced by permission of the American Anthropological Association from *American Anthropologist* 80: 1, March 1978. Not for further reproduction.

wide area of low-density resources is a policy of most benefit to the individual group. Families may shift residence between groups to increase adaptiveness.

In Mode A, the predictability of resources remains low but their occurrence is now localized into 'hot spots'. For the human groups concerned, this still requires a wide-ranging annual territory, and the precise location of key localized resources remains uncertain from season to season. It therefore continues to be infeasible to try and appropriate blocks of landscape as a preferential group territorial focus. On the other hand, key resources are focused into small areas, even though their position cannot be predicted. The required behaviour will be high mobility around a large landscape, and information-sharing between groups enabling a general concentration on 'hot spots' at certain times of the year.

Mode A already contains the seeds of a more sedentary and localized behaviour within the landscape. In Mode D, resources are found in low-density form but now with great predictability across the landscape. This still means that a human group needs potential access to a wide territory each year, but the requirement of inter-group shared access is obviated by the assurance that many distinct areas of each region have a reliable productivity. Under such circumstances, it is argued that each human group assumes preferential access to a particular district, its 'home-range', whilst foraging wider alongside other groups to complement and buffer over-dependence on the home-range. In the Australian Aborigine system, even the home-range can be used by other groups with the permission of the 'owners'; that is, if extremely severe years do not cause a critical reliance on the home-range.

Finally, Mode C represents the behaviour of human groups where resources are both highly predictable and very dense. Here cooperation and open access to the wider landscape are replaced by a systematic close tie between each group and a specific area; here resources are adequate for that group's flourishing and are sufficiently localized to sustain a behaviourally limited form of exploitation, perhaps from a single point of sedentary life central to the territory. Outsiders have little or no access to this narrow territory.

The sequence B–A–D–C is a trend of increasing behavioural focusing and territoriality. At one end of the spectrum, human groups can have fluid membership and no specific attachment to particular areas of landscape; at the other, the human group can become largely endogamous, with a fixed membership and economic behaviour highly localized on a territory largely or wholly claimed by the group for itself. In essence, we may expect the sequence broadly to mirror the behavioural implications of the increase in productivity achieved by the adoption of domestic plants and animals, and later by increases in economic productivity per acre occasioned by innovations such as the Secondary Products Revolution, animal traction and the plough (for both, see Sherratt 1981), developed bronze metallurgy and the spread of iron-working (Bintliff 1984, 1997). In the case of prehistoric Europe, from Palaeolithic to Mesolithic, then to Neolithic, Copper and Bronze Ages into the consecutive phases of the Iron Age, we would expect human behaviour on average to have become more territorial and more localized.

A second figure from anthropological case studies (Fig. 13.2) demonstrates how

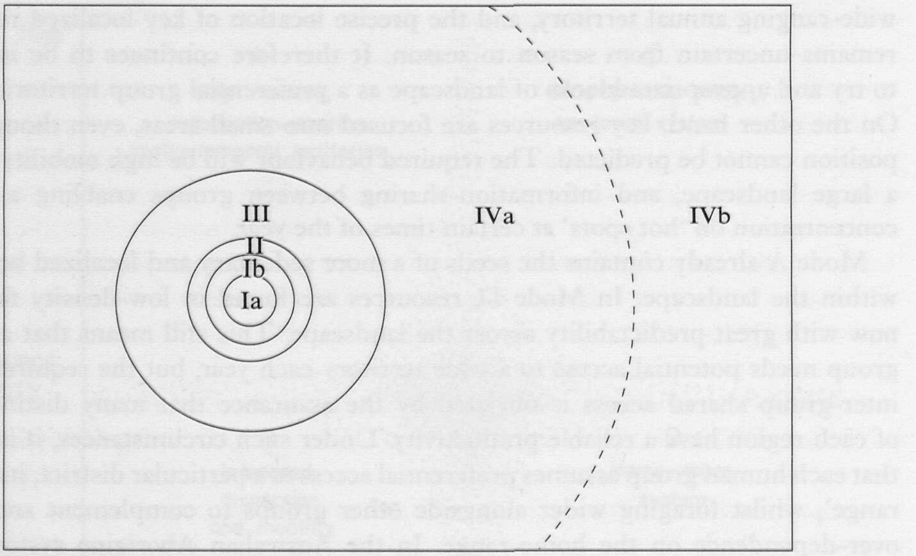


Figure 13.2 Concepts of radial territoriality in south-east Arabia. Ia: permanent cultivation (tree crops); Ib: permanent cultivation from less reliable base flow (alfalfa); II: seasonal crops; III: village grazing and sown land; IVa: mixed-herding nomads; IVb: camel-herding nomads. Source: Wilkinson 1983.

the entire range of minimal to maximal territorial behaviour may be found in a single historic landscape, in this case the traditional Middle East (Wilkinson 1983). In the centre of this district of south-east Arabia is a fertile oasis with perennial, abundant, irrigation water and highly intensive garden agriculture (Ia); its fields are privately owned and jealously guarded from outside access, whilst residence remains close to the resource and movement to subsistence activity minimal within the small zone concerned. Immediately concentric are other zones used by the sedentary village, but where water availability is less secure: in turn, permanent fodder crops, then seasonal crops (Ib and II) yield to village grazing (III). Formally delimited holdings and restricted family access are transformed into more communal, shared, access along this axis. Beyond this block of highly productive land use, significantly characterized by its exploiters as the 'sown' lands, lie the 'desert' lands, where water availability and average productivity drop to a low level and where extensive forms of land use are the rule, with flexible area use by year, season and month. Even here there is a distinction between the less arid and more vegetated sheep–goat zone (IVa) and the extremely arid camel-grazing zones (IVb), accompanied by a difference in the concept of grazing rights.

In summary, the total spectrum of land use here, conditioned primarily by the remarkable contrast within small distances in productive natural resources, creates a parallel spectrum of territorial behaviour, in which strictly private and spatially well-defined territory is modified by the other end of the behavioural spectrum to almost non-existent territorial behaviour as regards use of camel-grazing in the inner deserts. Notably, however, critical wells within the desert zone form miniature replicas of the oasis effect, as their rareness and predictability cause 'islands' of extreme territoriality to emerge in and immediately around them. We might consider the Arabian case to exemplify the broad trend from least-intensive forms of hunter-gatherer land use to most-intensive forms of commercial agriculture, and to represent to us the main lines of the development of territorial behaviour in world economic prehistory and the history of rural life.

HUMAN TERRITORIES: FROM STATIC TO DYNAMIC MODELS

A more consciously constructive critique of catchment analysis to that of Hodder, which will offer us a springboard for a thorough reworking of the approach, can be found in that masterly textbook of mature New/Processual Archaeology – Kent Flannery's (1976) *The Early Mesoamerican Village*. Central to Flannery's contribution to territorial analysis is his case study of the early maize-farming communities along the Atoyac Valley in the north-eastern district of the Oaxaca Valley (Fig. 13.3).

The first thing to note is that the settlement system along the valley can be understood dynamically, providing us with invaluable insights into changing attitudes to inter-site spacing and hence catchment boundaries. The earliest settlement is that of San José Mogote in the valley centre, significantly in one of the most fertile locations where the valley bottomlands are unusually broad. We cannot estimate its original catchment by internal evidence, in the absence of neighbours, but we might reasonably speculate that most of its subsistence activities will have lain within a classic 5-kilometre or 1-hour radius (T1). Some confirmation for this stems from the second phase of farming settlement in the valley, when two new hamlets (Sta. Marta Etla and T. Largas) are established upstream and downstream of Mogote, plausibly by colonization from the founder village. As Flannery shows, the three farming hamlets of this stage are so regularly spaced as to imply a 5-kilometre radius territory for each (T2).

In a third stage of settlement evolution, a further two hamlets are established in the valley, but this time they are positioned exactly intermediate to the existing three hamlets. Once again Flannery suggests that these represent population overflow from the existing hamlets, and illustrates how the implied territorial network has been transformed into a rather exact series of 2.5-kilometre radius catchments (approximately half-hour territories) (T3). There is in fact one final stage of new foundations, where very small foci appear within some of these territories,

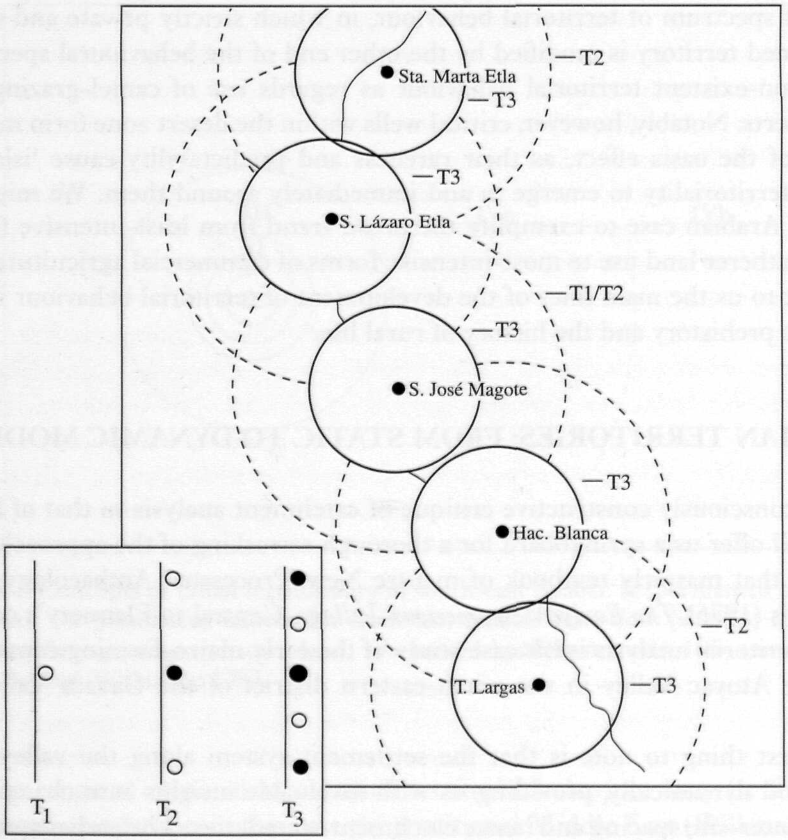


Figure 13.3 Early Formative villages along the Atoyac River in the north-eastern Valley of Oaxaca (Mexico); catchment circles with radii of 2.5 kilometres (solid line), 5 kilometres (dashed line). Inset: idealized model of settlement evolution along the Atoyac River during three temporal phases. Source: Flannery 1976.

apparently close satellites of the main settlements. It is also significant that, whereas Mogote exhibits a continual population rise until it represents the 'central place' for the valley, the other four main settlements remain as small hamlets for upwards of a thousand years, suggesting that their half-hour interval network approximates to a kind of long-term stability.

Flannery's thoughtful discussion demonstrates a dynamic development of territory size, so that we may conclude that the 5-kilometre farming radius may operate in certain settlement scenarios, such as pioneer farming 'infill' situations, but not others, with mature 'filled' farming landscapes stabilizing into 2.5-kilometre radius catchments. It also raises an unexpected but crucial difficulty: given that the Atoyac valley settlements are located to give prime access to the most important local resource – the fertile valley bottomland, for maize agriculture – how much territory is required to feed the estimated population of the five major settlements?

All but Mogote are argued to have been quite small hamlets of less than a hundred people, and their chief needs would have been met by a very small area of alluvial land indeed. Even Mogote at its peak was probably not straining the alluvial land's productivity within its 2.5-kilometre radius territory. It is therefore undeniable that the initial 5-kilometre radius and even the later stable 2.5-kilometre radius cannot arise from an area of land required by these settlements for intensive land use: they appear to have far more territory than they really need.

Flannery's solution is to shift discussion away from resource control towards social factors. When Mogote colonizes the valley with daughter settlements, the intervening distance is not economic but 'social'; the same must hold for the subsequent division of territory to provide discrete territories for the next group of daughter hamlets. Groups leaving older hamlets settle near their relatives, but maintain a greater separation in space than simple land use economics require, for reasons to do with their evolving social organization. Flannery does not offer any additional information about how these social factors operate, and it rather appears that this is a tentative suggestion to replace the seeming inadequacy of simple environmentalism. As we shall see later, social factors do indeed have a fundamental role to play in the establishment of village networks like that in the Atoyac valley, but there are more plausible ways to account for regularities in settlement spacing and associated territory size which remain within the realm of functional economic behaviour.

It is important to remind ourselves that case studies of settlement networks in many different parts of the world reveal a similar propensity for evolving community patterns to settle into regular spacings. In what follows, I shall narrow our focus onto pre-industrial mixed farming societies. Do we find that such systems repeat the ideal maxima of catchment analysis, or dynamic 'nested' patterns as in the Atoyac valley?

Dennell and Webley's (1975) neolithic Bulgarian *tell* villages show a tendency to crystallize into territories of some 3–4 kilometre radius, relatively stable over more than a millennium (inter-site distance is 5–6 kilometres, but the territories are asymmetric to the *tells*). In a very different area and time period – ninth-century AD Brittany – plentiful historic sources show an established village pattern (*plebes*) with a consistent inter-site distance indicating territorial radii of 3–4 kilometres (Davies 1988; Fig. 13.4); however, during high medieval and early modern times, parish numbers almost doubled, giving average radii of 2–3 kilometres. In early medieval Holland, settlement territories have been inferred with a 2.5-kilometre average radius (Heidinga 1987). In high medieval northern France, a typical village territory was 2.5 kilometres in radius (Pounds 1974: 188), whilst contemporary English village parishes cluster into two groups: early 'heartland'/secondary

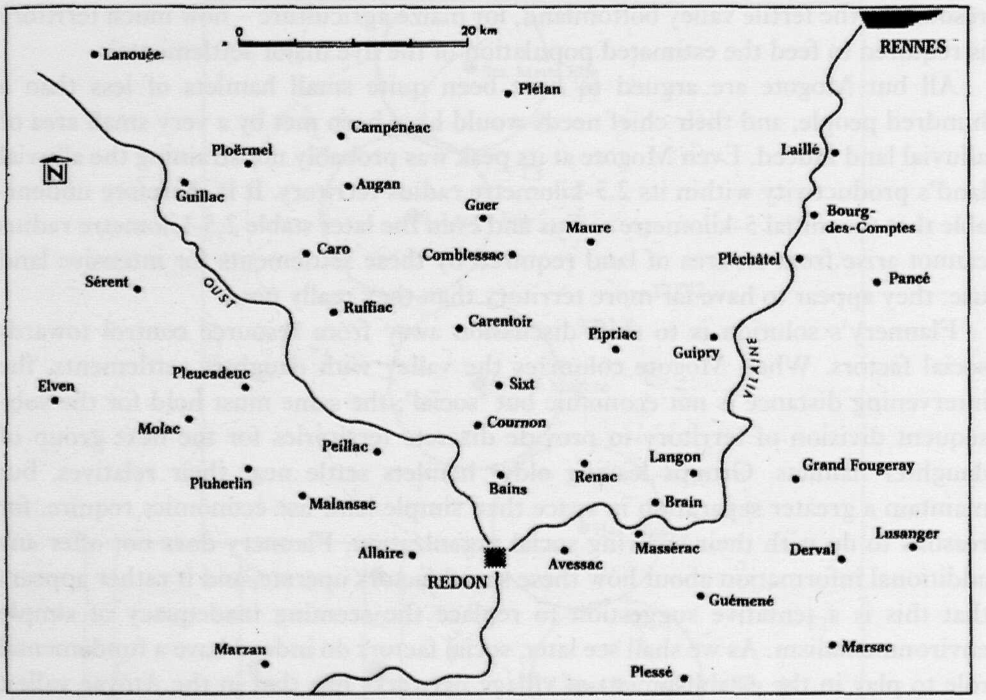


Figure 13.4 Ninth-century AD 'plebes' and 'plebiculae' (villages and hamlets) in Brittany. Source: Davies 1988.

pioneer woodland larger territories of 2–3 kilometre radius; and secondary infill/upland smaller territories of 1–2 kilometre radius (Beresford and St Joseph 1979; Everitt 1986). Brian Roberts's detailed study of Warwickshire medieval village territories (1977) found a median of 2.5 kilometres to their boundaries.

In fact, settlement systems with radii of 2–3 kilometres, comparable with Flannery's inferred stable Mexican pattern, are hitherto the most frequently represented. Ellison and Harriss (1972), in their territorial analysis of southern English settlement systems from bronze age to early medieval times, found a radius of 2 kilometres most appropriate from empirical indications. In Classical Greece (Bintliff 1994), mature systems of villages and small towns in central Greece gravitate around a territory of 2.5-kilometre radius (Fig. 13.5), as does the remoter countryside of the hinterland of ancient Athens (Fig. 13.6); however, in the immediate environs of Athens, much smaller village territories of 1–2 kilometre radii appear.

It is clear from these archaeological and historical case studies that a number of what we might tentatively call 'settlement quanta' are becoming recognizable in farming territory dimensions – recurrent values, or better: ranges of values. When

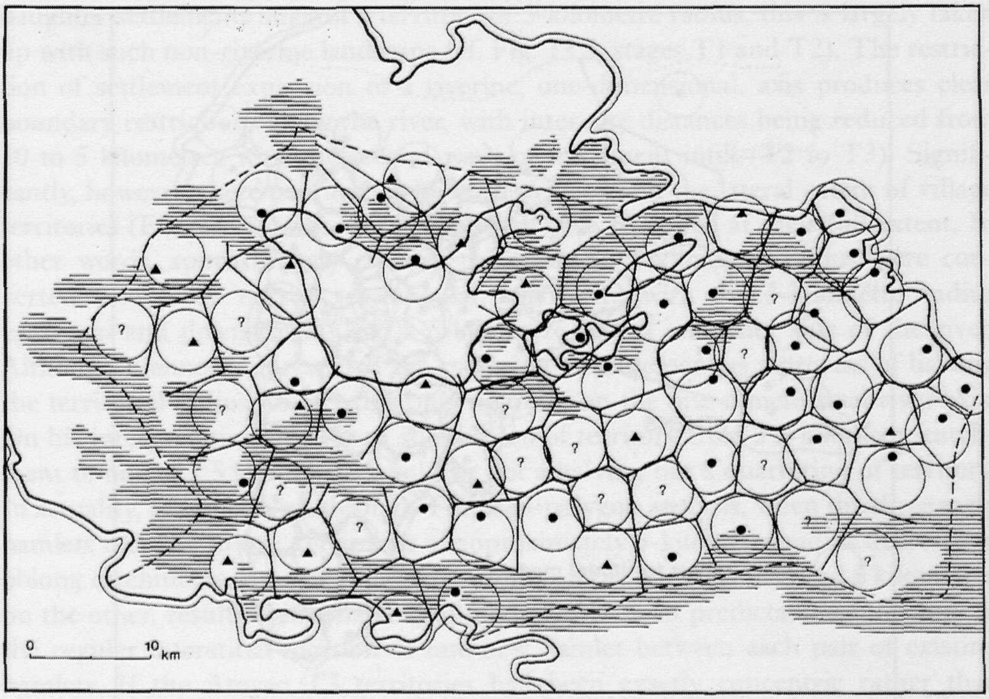


Figure 13.5 Known (solid symbols) and hypothesized (question-marks) nucleated settlement system in the classical era for the region of Boeotia, central Greece; cities are indicated by triangles, villages by circles. Best-fit circles of 2.5-kilometre radius have been fitted within village–city subsistence territories first defined through Thiessen polygons (the solid line cells). Shading represents infertile uplands. Source: J. Bintliff 1994.

information is detailed enough to allow us to follow the evolutionary dynamics of a settlement system, we sometimes observe the metamorphosis of a network from one set of values to another, usually smaller, set. It is not problematic to detect the underlying mechanisms at work, which are the same that we have observed in the Atoyac valley: as a landscape is populated by villages, large territories are established first, but over time the further multiplication of settlements occurs through infill between pioneer communities, an accommodation achieved through the progressive subdivision of land at the expense of existing territorial units.

This transformational series may be hypothesized to include quanta from a 5-kilometre radius, through 3–4 kilometres, to 2–3 kilometres, and finally to 1–2 kilometres, rarely to less than 1 kilometre. Flannery's Atoyac valley seems to move directly from 5 to 2.5 kilometres without an intervening stage, and finally gives rise to occasional tiny satellite hamlets nested within the 2.5-kilometre territory and with arguably less than 1-kilometre radius catchments. It is likely, however, that

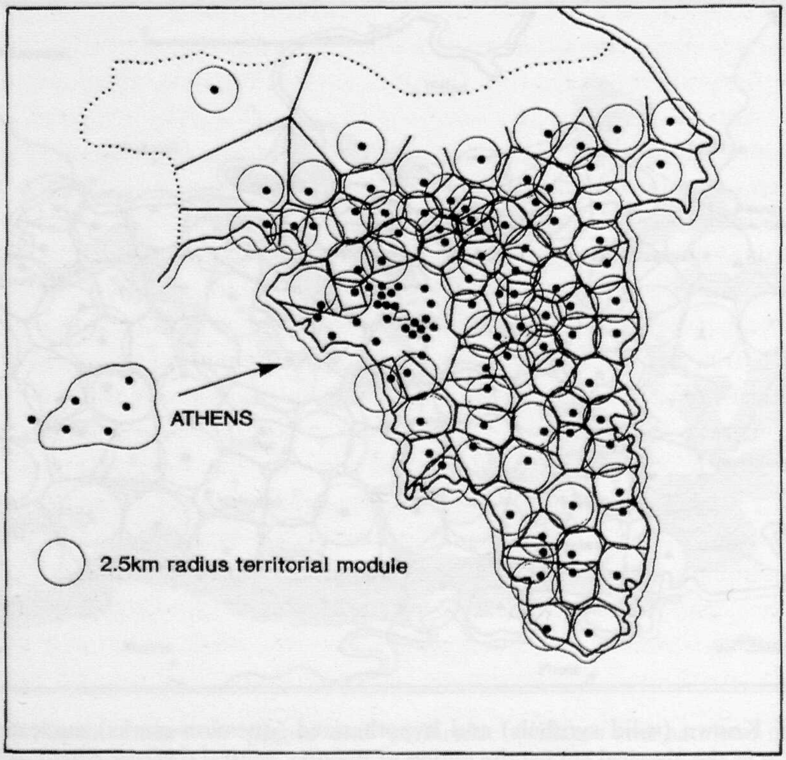


Figure 13.6 Known village communities in classical Attica (the territory of ancient Athens): territorial analysis through Thiessen polygons (the solid line cells) within which a best-fit module of 2.5-kilometre radius has been fitted, with the exception of the dense cluster of villages around Athens city itself. Source: J. Bintliff 1994.

Flannery has omitted to take account of the rather special characteristics of riverine settlement networks; to investigate this, we need to consider the geometry of territory.

THE GEOMETRY OF TERRITORY

The evolution of Atoyac valley settlement was constrained by the linear character of the river, since the prime locational attraction for its early farming villages was river alluvium for highly productive maize agriculture. As villages multiplied they expanded in axial, one-dimensional mode upstream and downstream. None the less, as Flannery reminds us, villagers in the valley were also regularly exploiting a wider range of resources in the adjacent piedmont zones and remoter upland areas on either side of the river. If the initial hamlet of Mogote and its first wave of two daughter settlements suggest a territory of 5-kilometre radius, this is largely taken up with such non-riverine landscape (cf. Fig. 13.3, stages T1 and T2). The restriction of settlement expansion to a riverine, one-dimensional, axis produces clear boundary restrictions along the river, with inter-site distances being reduced from 10 to 5 kilometres with the second wave of settlement infill (T2 to T3). Significantly, however, there continue to be no restrictions on the lateral extent of village territories (Fig. 13.7a), which will doubtless have remained at their full extent. In other words, approximately circular territories of 5-kilometre radius were converted into more narrow, rectangular, territories with a 2.5-kilometre radius upstream and downstream, and a 5-kilometre radius on either side of the river. Although Flannery represented the evolution of settlement as a process of halving the territorial radius, in fact this only operates on the one-dimensional river axis. On his interpretation, the actual subdivision of territory from a 5-kilometre catchment to one of 2.5 kilometres would be not a halving but a quartering of territory. In actuality, as can be seen through Thiessen-polygon analysis, when the three early hamlets increase to five, territories of approximately 5-kilometre radius decrease to oblong catchments some 2.5-kilometre radius on the one river axis and 5 kilometres on the other, resulting in a halving of territorial area, in predictable conformity to the regular interstitial location of one new hamlet between each pair of existing hamlets. If the Atoyac T3 territories had been exactly concentric rather than asymmetric, their radius would be around 3–4 kilometres.

It is generally advantageous to combine the overall concept of radial territories with empirical outlining of likely boundaries between neighbouring sites utilizing a technique such as Thiessen polygon analysis, so that asymmetrical territories can be identified at an early stage. Thiessen analysis is a simple method for suggesting plausible boundaries between territories of settlements considered originally to have been of comparable status, and operates as follows: connecting lines are drawn faintly between each contiguous settlement, then bisected, with strongly emphasized lines being drawn at right angles to the bisection points; these lines at right-angles to connecting lines are then extended until they bisect each other, thus creating polygonal cell walls around each settlement – the Thiessen Polygons. On the reasonable principle that a boundary between two communities of comparable status is more likely to be at a midpoint between these settlements than close to one particular community, these midpoint cell walls are taken as approximations to actual territorial divisions.

What axial settlement networks emphasize is the path of the priority resource zone and its properties, so that continued village colonization produces skewed territory shapes. This process was shown very clearly by Ellison and Harriss (1972) in their analysis of the well-known 'strip-parishes' of the southern English chalk downlands (Figs 13.7b and 13.7c), where early medieval settlements multiply along valley systems through continuous subdivision of valley land (early settlements

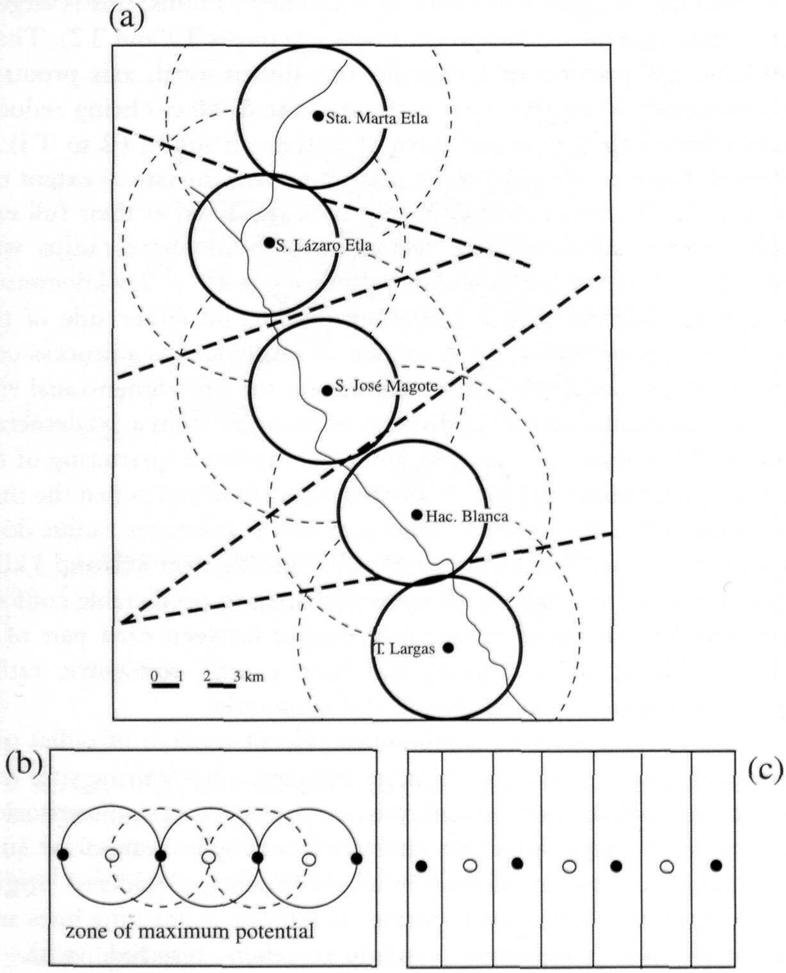


Figure 13.7 (a) Formative villages in the Atoyac valley, Mexico, with 2.5-kilometre radius territories modified by Theissen polygon analysis, (b) and (c) creation of strip territories through linear infill along a preferred resource band. (a) Source: Flannery 1976; (b) and (c) Source: Ellison and Harriss 1972.

white, secondary black), whilst retaining similar lengths of elongated territory stretching up onto plateau country to either side.

The other examples of territorial quanta for farming systems that we cited earlier do not belong to axial systems like the Atoyac valley, but to a much commoner form of settlement evolution in which desirable resources extend in all directions. These two-dimensional systems are typified by villages which multiply across the landscape in all compass directions from primary colonies (Fig. 13.8a). If we rerun

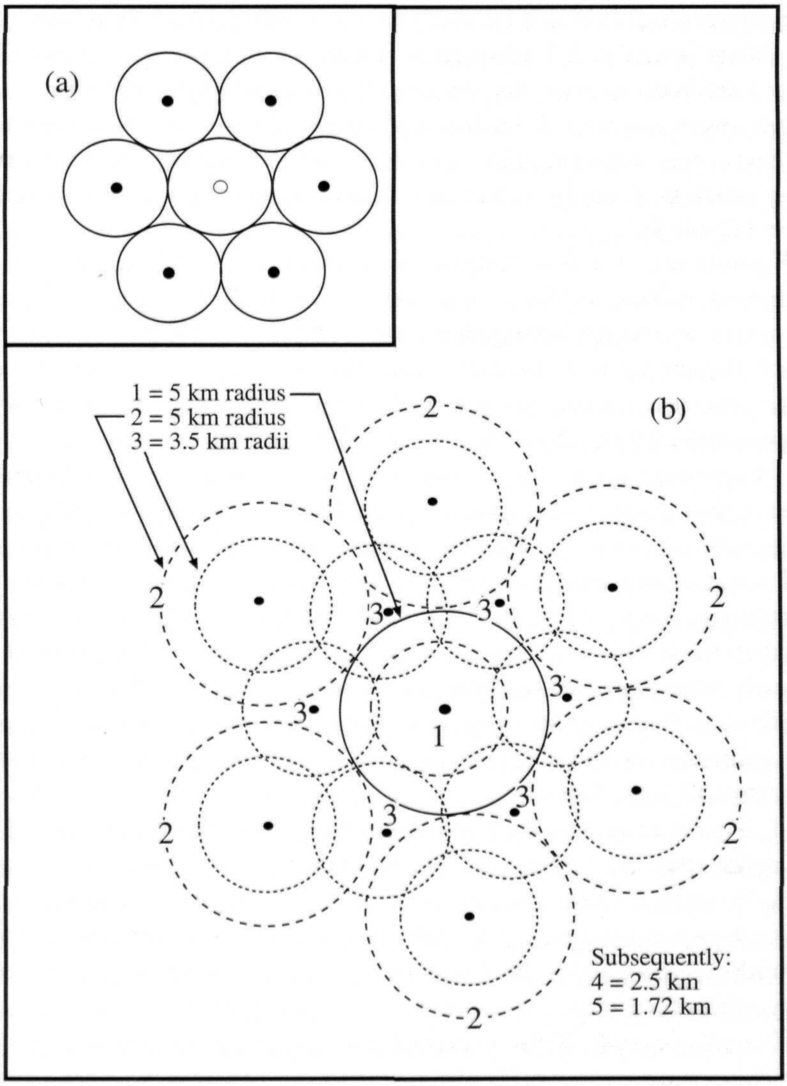


Figure 13.8 (a) Two-dimensional settlement expansion model (re-drawn from Ellison and Harriss 1972: fig. 24.16); (b) model of secondary expansion 2 from primary settlement 1 followed by tertiary interstitial infill 3. Source: J. Bintliff.

the dynamic spread of farming villages, this time allowing daughter colonies to spread in all directions from a single pioneer community before interstitial infill, the sequence might run as follows (Fig. 13.8b): pioneer village colonizes its surroundings (Phase 1); in an ideal scenario a single, 5-kilometre radius, origin community would eventually be surrounded by a complement of six secondary hamlets each with a 5-kilometre radius catchment (Phase 2); if a tertiary series of daughter villages was founded between all the existing six villages, the new radius for all hamlets becomes 3.5 kilometres (Phase 3); if a further series of daughter settlements infilled between the tertiary network, average catchment size for all settlements decreases to a 2.5-kilometre radius (Phase 4); a final subdivision of existing territories accommodates yet one more series of daughter settlements appearing between all previous hamlets, producing average catchment radii of 1.72 kilometres (Phase 5).

Three points are worth making in connection with this geometrical series of colonizing and infilling villages. First, although it might seem overly mathematical and 'inhuman' to reduce human settlement history to a game of landscape geometry, as if ancient farmers went out each time marking boundaries in fractions of modern kilometres, actually we are merely reducing to quantitative form a very simple operation: the equal division of an existing territory between an old village and new neighbours appearing between it and its former nearest neighbours. In effect, the territories of each stage of settlement are being subdivided by half to give land to interstitial colonies. This basic series of equal subdivision produces the observed series of decreasing catchment radii with each new generation of settlements, from 5 to 3.5 to 2.5 to 1.72 kilometre radii. Of course there is no reason to suppose that these exact figures were duplicated in the real process of dividing lands equally with daughter settlements, rather one might look for settlement networks peaking in the following ranges of quanta: *c.* 5, 3–4, 2–3 and 2–1 kilometres as plausible evidence for different stages in the maturity of agricultural settlement infill in particular landscapes.

Second, our discussion of settlement geometry dynamics underlines the importance of delineating the overall shape and symmetry, or asymmetry, of empirical territories, through a simple technique such as Thiessen polygon analysis, rather than taking a measure such as inter-site distance as a reliable guide to the average radius or radius-equivalent of a settlement's catchment. Villages may appear to cluster closely when they locate on a restricted resource which is clustered, but their individual territories may extend asymmetrically to greater distances as in the Atoyac valley, or the strip parishes of Saxon England. In contrast, in a landscape where resources vary little two-dimensionally or are found widely if discretely, settlement locations may be found to approximate closer to the geometric focus of circular territories, as in Classical Greece, ninth-century AD Brittany and neolithic Bulgaria.

Third, our proposed colonization model is strikingly comparable with that developed by Bylund from theoretical and empirical evidence for the early modern colonization process in northern Sweden (Bylund, 1960: fig. 4, Model F).

A final variation can be noted: if resources are 'isotropic' (equal in all directions), settlement territories will not only tend to recurrent size/radius/quanta and be evenly packed across the landscape, but the village or hamlet will tend to be exactly central to its territory. If, however, resources are distributed patchily across the landscape, and/or the settlement focus requires localized factors such as spring-water or a defensive position, the village may occupy a position asymmetric to its modular territory. Thus in Figures 13.5 and 13.6 the modular territories have been defined by Thiessen polygons and the module size detected through placing best-fit standard-radius circles within them. Providing that distances are limited to the furthest boundary (usually less than one hour), the friction of distance will allow such asymmetries as a trade-off against other locational considerations.

FLANNERY'S CARRYING CAPACITY CRITIQUE

Through our examination of Dynamic Catchments we have developed a new, flexible model of farming catchments 'nested' over time as the settlement system matures, population rises and existing territories have to be equably subdivided. In fact we can suggest that only two additional explanatory elements are needed to supplement the 'territory halving' process, in order to account for our entire sequence of nested catchments from 5 to 2–1 kilometre radii networks.

The first factor operates at the very beginning of farming settlement sequences, and relates to a putative outer, limiting, parameter of a 5-kilometre or 1-hour radius catchment. In Vita-Finzi and Higgs's first statement of Site Catchment Analysis this radius was considered as a recurrent constraint for farming sites. The figure originates essentially from observations in recent rural societies in various parts of the world where traditional technologies dominated, being indirectly derived from Chisholm's (1962) generalization that distance constraints become significant in a 2–4 kilometre radius from the farm and lead to little intensive agriculture beyond 5 kilometres. Interesting and promising though this statement is, it is perhaps surprising that empirical evidence *can* be found in archaeological and historical settlement systems for the effective operation of such a quantum in conditioning pioneer catchment boundaries. The initial infill of the Atoyac valley is such a case in point. It is also possible to simulate the creation of later systems with 3–4, 2–3 and 1–2 kilometre radius catchments through the simple operation of a settlement doubling/territory halving principle. According to whether resources are isotropically (relatively widely and equally) distributed, or clustered, these quanta of maturing settlement catchments may be recognized in a 'pure' form as symmetrical territories, sites in geometric focus, approximately circular shape, or 'skewed' form as asymmetric territories, sites decentred, territory shapes irregular. We can further characterize these two modes as 'quantum-radius' and 'quantum-radius equivalent' territories.

We noted earlier that both the first wave of 5-kilometre radius farming hamlets in the Atoyac valley, and the second wave of 3.5-kilometre radius-equivalent settlements, created catchments far in excess of their subsistence needs, with the possible single exception of the prime central-place village of Mogote, based on calculations of population derived from the surface area of these sites. On the face of it, this seems to undermine the initial thesis of Vita-Finzi and Higgs and their sources in human ecology, that catchment sizes are the product of the resource needs of a community and the least effort principle active in obtaining those resources. On this basis Flannery moved to consider 'social' explanations for catchment size.

The natural question to put is why, at a certain stage, offspring settlements begin to appear between existing communities and take territory from them? In the Atoyac case, for example, it is reasonable to consider most of the valley as barely exploited from the pioneer hamlet of Mogote, so that its initial pair of daughter settlements were free to append full 1-hour territories to the borders of their catchment. When the following pair of daughter hamlets was given off, however, it appears that remoter upstream and downstream locations were not available, so that these surplus populations had to be accommodated within the existing territories of older settlements. The same can be claimed for the addition of tiny satellite hamlets at an even later stage, located close to some members of the stable hamlet network.

Here Flannery's observations on carrying capacity of the landscape come into their own: we can now see that such a process of territorial subdivision was not actually problematic, as the 1-hour catchments were something of a luxury for the early hamlets, enclosing more resources than were essential to their comfortable survival. The primary 1-hour radius might be hypothesized to be a maximal resource zone easily buffering the community against shortages, yet compatible with the friction of distance. Indeed, we might suggest that the sequence from 1-hour radius through the other quanta to a 2–3 kilometre radius may proceed quite frequently without undue stress on the communities involved. What was at first obtained at least in part extensively could be produced intensively later, but within a smaller radius. At this point, however, further territorial subdivision could leave a nucleated village community with inadequate 'buffering' against bad harvests, crop pests, and other threats that often strike such societies. Hypothetically, we might see something of the order of a 1-kilometre radius territory as a critical radius, enclosing the necessary resources for farming communities to ensure survival in the long term. This lower limit constitutes our second factor in territorial dynamics.

The most frequently observed empirical quantum is a 2–3 kilometre radius settlement network. It is likely that this favoured range of catchment represents the ideal compromise between the need to move from the ideal 1-hour radius (essentially set by time–labour constraints) to allow for settlement infill within a landscape, and the need to avoid extreme diminution of territory and the threat of disaster from over-reliance on limited resources. A corollary of this train of thought is that settlement systems in the 3–4 and 2–3 kilometre quanta are probably reasonably stable, whilst those in the 1–2 kilometre range may be symptomatic of societies under resource and/or overpopulation stress.

In the above reflections I may have seemed to generalize rather grandly, on a world scale, and without regard to culture or period variations. It is of course necessary to avoid claiming 'laws' of settlement behaviour valid for any time or society, based on a relatively small series of case studies, even if they do surprisingly derive from contrasted cultural contexts and physical environments. So we should set out the scope and applicability of a revised, flexible territorial analysis, for which we have laid the foundations above.

I have tried to demonstrate that empirical research on pre-industrial farming settlements supports the existence of several quanta of territorial size. In some individual examples, settlement networks appear to gravitate from one quantum to the next, smaller, quantum. It can be suggested on theoretical grounds that such sequences are the result of a simple process of subdivision of landscape between parent and daughter communities. The value of these quanta might be set from two enclosing parameters – the 1-hour/5-kilometre radius walking-time constraint, and a critical radius of some 1 kilometre enclosing a survival resource zone, together with the dynamic process of geometric halving. Mature, stable, systems in the 2–3 kilometre range might occur with predictable frequency as a result of population growth, landscape infill, and catchment subdivision, constrained by the desire to control a territory with buffering capacity beyond the quanta of stress and bare survival.

Although it might be expected that in many regions and cultures the first development of farming villages, or subsequent recolonization phases following decline or abandonment, would follow an infill sequence beginning with individual sites adopting the time-conditioned 1-hour radius, it is quite conceivable that settlers spreading outwards from a mature settlement network which had already reached a 'stable' half-hour radius norm might carry that quantum with them. If settlement was large scale under conditions of considerable population pressure, it is also possible that even smaller territories might be established, unless the newly colonized area was reasonably extensive. Only with the painstaking reconstruction of stage-by-stage settlement dynamics shall we be able to identify which of these processes operated in a particular district. The averages quoted above for the size of different types of English medieval parishes may reflect the latter two models at work.

But could farming societies adopt very different forms of settlement, ignoring the pathways that these examples illustrate? We cannot deny this, and it would be against the spirit of the present exercise to claim universal laws. All that we can argue for is an understanding of how particular empirical networks may have arisen. A characteristic of our dynamic modelling is its 'ideal' form. We have tended to speculate in general terms about axial or two-dimensional landscapes, allowing those two to be uniform. In reality, all landscapes are more varied than this, and the precise point chosen for a village may be the result of a combination of locational factors, as already noted in connection with ancient Greek village/city-state territories. Thus the catchment could have been selected both in terms of the overall availability of preferred resources and the position of older settlements, yet within that catchment village location might be influenced by a prominent spring, a defensive hill, favourable winds, a river crossing, as well of course – as we have seen – by the shape of a critical resource. It may be helpful to see locational strategies as a kind of game played out in time and space, in which several factors, some competing, were demanding the attention of settlers at one and the same time. And let us not forget an earlier caveat, that in some societies the rules of that game were largely set to the disadvantage of settlers, when dominant groups displaced or marginalized subordinate communities into restricted environments. In extreme cases of the latter kind, locational decisions may have been made by others, imposing catchment constraints on communities; even so, the study of such territories will be highly revealing both of the pressures such landscapes could impose on village development, and the various ways marginal groups sought to adapt to their particular circumstances such as through the development of special economies, investment in resource enhancement through terracing, water control and so on.

SETTLEMENT SIZE AND SOCIAL SPACE

Two fundamental questions we now need to turn to are: why do farming people live so frequently in agglomerated settlements, typically 'the village'?, and why do villages and hamlets produce daughter settlements which infill the landscape around them?

No family can survive without frequent association with a wider human society: apart from the search for non-incestuous mates to perpetuate the population, human groups require in the longer term the mutual support of a number of families, to provide help in time of sickness, danger, or premature death, to assist in work tasks where several adults are advantageous if not essential, and also to provide a pool of practical lore about resources, technology, and life-skills. One oft-quoted figure suggests that a human group of some twenty-five individuals or more might be the scale of such a minimal support-group required as near-neighbours for a successful human community (Dodgshon 1987). In practice, observable villages are usually a good deal larger than this lower limit, though characteristically with populations typically in the hundreds rather than thousands.

Of course such a district-society need not live in a single camp or hamlet, but could occupy individual homes or clusters of homes in a dispersed network stretching across a small landscape. This kind of dispersed community is especially associated with landscapes where resources are patchy or land use is very extensive, and is common in predominantly pastoral economies. Space precludes a discussion of territoriality in dispersed agro-pastoral communities, where interesting modifications to catchments occur, although still within a definable 'village territory'. On the other hand, it is more common for village–hamlet communities to live predominantly or essentially at a single nucleated location, at which point our nucleated community catchment quanta might be expected. However, whether the self-defining 'community' of hamlet or village is nucleated or dispersed, the extraordinary prevalence of this mode of society in mixed-farming societies around the world, with average membership well above the twenty-five or so minimum, requires explanation.

In 1972 the social anthropologist Anthony Forge published an analysis of community size in traditional rural Indonesia. Using a very large database, he proposed the following principles underlying regularities in the size and social organization of Melanesian settlements: (1) in communities up to some 150 members (or some thirty-five adult men), face-to-face relationships and direct close kinship were sufficient for coherent social structure; (2) communities larger than 150 and up to 300/400 members (35–85 adult men) consistently adopted sub-group organization such as clans, subclans and lineages to facilitate social cohesion, these sub-groups being manifested by hamlet strings or clusters making up the overall settlement (the latter sometimes stockaded); and (3) if communities developed beyond 300/400, they split into totally separate residential blocks with their own landholding zones and often stockades. By far the commonest settlement size was Type 2, with Type 3 argued to be a specific response to regular warfare (two or three Type 2 communities linked politically for mutual defence). Although these societies are described as 'egalitarian', they are actually characterized by typical 'Big Man' dominance structures – the dominance of a few males without hereditary power.

Forge suggested that Big Man systems favoured the emphasis on Type 2 villages: with less than thirty-five adult males (Type 1 settlements), individual Big Men could achieve prolonged influence, whilst with more than eighty-five men the number of players for dominance would be too large for any control over 'the power game' to be exercised. The optimum community of 150–350 had the right range of Big Men to sustain their existence in a stable structure without risk of individual tyranny. Since communities over 150 members require subdivision to place people into manageable categories, village structure had to be modified into distinct social, religious, and often residential groups. When communities reached numbers over 400 or so, they had to be composed of village pairings or triads. Archaeologically, we might view this series of social and political communities of increasing size using different terms from Forge: on the ground we would see Type 1 as small hamlets, Type 2 as a hamlet cluster or village, and Type 3 as separate but contiguous villages, each composed of hamlet clusters.

The physical anthropologist Robin Dunbar has also addressed the same question of quanta in the social groupings of traditional societies (Dunbar 1992, 1996). His approach has been radically different, focusing on an hypothesized connection between the complexity of the brain in primates and the size of their social groups, and in particular on the size of the neocortex area believed to be linked to socialization. Finding a demonstrable trend in primates, he extrapolated the ratio to predict from neocortex proportions the natural size of social groups whose interrelations were suited to the relative brain complexity of humans: the number was approximately 150. Put in very simple terms, Dunbar argued that human and primate social groups that operate on the primary principle of individual members memorizing each other's personal attributes and relations, are limited in size by the filing and sorting capacities of the relevant part of the brain. Assembling together a set of statistics for stable groupings of mobile or settled hunter-gatherers, and non-hierarchical traditional agricultural societies (localized clans and hamlets respectively), he found their average size to be 153. The simple explanation for recurrent limits on these human social groups that are not internally stratified is our inability to memorize upwards of 200 or so individuals in face-to-face contact, as well as updating their interrelations over time.

Dunbar's thesis is strikingly consistent with that of Forge, with the latter demonstrating that village communities that do manage to pass beyond the 200 or so population threshold achieve this through the creation of formal social subdivisions as well as residential segregation. The operation of social stress on communities rising beyond the 150–200 person level provides a very plausible explanation for the widely observed phenomenon of village fission in traditional farming societies studied by ethnographers. It can even be demonstrated that, in some societies, recognition of this process has become formalized into a cultural norm: amongst the ultra-traditionalist, primitive-Christian Hutterite communities of North America, for example, it is a fixed principle that when a village grows beyond 125 members it must split in two, on the explicit grounds that the social cohesion of the community is threatened above that level (Holzach 1979).

Thus there is a natural tendency for human residential groups to stabilize between twenty-five and 150–200 members, in the absence of strong mechanisms to counteract social division. We can group such strong mechanisms, allowing communities to grow to many hundreds or even thousands in size, into two basic types: horizontal mechanisms, where the society is subdivided into complementary social units such as clans, lineages, moieties; and vertical mechanisms, where the society is stratified in a hierarchy of authority.

Another parameter that is of central relevance to pre-industrial settlement systems is that of mating networks. Wobst (1974, 1976) has claimed that human groups need to operate marriage networks of at least 400–500 individuals to avoid the negative effects of an inbred gene pool on human health and fitness. The implication for the work of Forge and Dunbar is that, although the most natural social group for human cognition is below 150 members, other, equally natural, forces will require such groups to maintain exogamous relations with their neighbours.

In Melanesia, Forge showed that the village population norm of 150–350 or so individuals per community only found social coherence through the existence of internal subdivision into social and physical sub-groupings. Interestingly, he commented that these sub-groups have important social relations, not just with the other sub-groups constituting the immediate village community, but with groups of a similar order in other villages. Since the community will not be large enough for a Wobstian gene pool, clan/subclan networks of this kind would be essential to allow adequate mates to be found beyond the Type 2 village. With Forge's Type 3 communities, combining two or three Type 2 communities, total population will be above the mating network parameter, and one could consider whether the advantages of such political groups go beyond the considerations of defence paramount in Forge's analysis. Significantly though, the increasing separation in space that we see in Melanesia when crossing from Type 1 to 2 and then to Type 3 communities indicates the difficulty of sustaining a genuinely physically cohesive nucleated settlement of more than some 150 members.

SETTLEMENT FISSION AND THE EVOLUTION OF NETWORKS

This preceding discussion provides insights into the processes of settlement fission and landscape infill that we have already observed empirically in Formative Mesoamerica and Anglo-Saxon England. The fact that fission seems to occur well before population presses against available territory, at hamlet level, can be given a social explanation (just as Flannery had surmised), and we may expect to find the relevant hamlets to be characteristically less than two hundred inhabitants, but rarely smaller than twenty-five people (Dunbar's average is 150, but the range of empirical examples is 100–230). The corollary is that settlements which push well above the Forge/Dunbar face-to-face threshold can be expected to have adopted sub-groupings, whether through lineages, clans, or dominance hierarchies; possibly such categories may be spatially discrete within such larger settlements.

Before taking our discussion of these latter, larger, villages any further, it is worth testing the proposition of social group quanta on other empirical databases. One of the largest settlement inventories in pre-industrial times is the Domesday Book, in which William the Conqueror sought to tabulate the human, animal, and land resources available to him in recently conquered Anglo-Saxon England (Hill 1981; Fig. 13.9). A commonly accepted estimate gives 2–3 million people for Domesday England, a figure which doubled or trebled by the early thirteenth century. Current opinion would consider this AD 1086 record as that of a countryside composed of 'naturally arising' village communities whose population was typically well below the maximum capacity of the land to support.

Rather surprisingly, although innumerable analyses have been made of the

Figure 13.9 Settlements in Domesday Book. Source: D. Hill.

statistics available in Domesday Book, only one source to my knowledge interests itself in the size of listed 'vills' (Hallam 1981), despite the fact that there are some 13,400 villages inventoried. Although these 'vills' include both nucleated and dispersed communities, for our purposes the significant fact is that they exist as social groups within a defined territory, that is, they are 'village communities'. Hallam's comments on average village size are general but significant: eastern England – 150 people; south-east England – 150; east Midlands – 115; south England – 120; the Welsh Borderlands – 54; Devon – 88; Cornwall – 82; Yorkshire – 21. The most reasonable hypothesis to account for these data is that the consistent range of average village size, remarkably within that predicted theoretically above, is the product of the preferred maintenance of face-to-face communities at this stage in settlement growth and landscape infill. It is probable that surplus growth above 150 has been exported via fission to adjacent, underdeveloped or undeveloped sectors of the regional landscape. Intriguingly, this would suggest that the wider political context of later Anglo-Saxon society, strongly hierarchical and nascent-feudal *above* the level of the village community, is not the central factor in the colonization of the landscape and the mode of rural settlement. Early medieval settlement units in Holland have also been postulated to have held around a hundred individuals (Heidinga 1987: 164).

From this basis we may search for additional settlement systems conforming to these norms. It may be expected that communities fissioning below the 150–200 person range will be especially typical for rural societies in which both internal social stratification and horizontal social segmentation are insignificant. It is most appropriate to approach cultural contexts believed likely to be characterized by relatively simple internal social structure, such as early farming communities. One example is the Neolithic of the Middle East, where farming villages appear on average to be composed of populations of 50–200 people (Redman 1978: 143, 181, 188). For the neolithic *tell* societies of the Balkans, John Chapman (1989) has indicated village populations averaging 60–90 and rarely more than 120 people. Flannery's farming hamlet network in the Atoyac valley stabilizes at under a hundred people per hamlet, except for the original settlement of San José which predictably develops into a central place with putative social hierarchy. The Domesday example shows that even within Anglo-Saxon England, a society with a highly developed state structure and class divisions, the dominant form of settlement, the rural village (whether nucleated or dispersed around its defined territory), has a population dynamic appropriate to a relatively undifferentiated community. For more recent times, a well-documented study of the Greek Peloponnese around AD 1700 shows that the average population in a sample of over 1,400 villages is consistently under a hundred people (Sauerwein 1969).

Following Wobst's principle of the extended mating-network, such 'basic' village systems can be expected to practise exogamy or out-marriage in order to participate in a genetic pool removed from the obvious dangers of close-kin inbreeding. In fact a creative tension has now been created between the operation of the Forge/Dunbar social fission model and the Wobst demographic pool model. Should we not consider the likelihood that one of the principal reasons why pioneer settlements grow to fission size and populate their *immediate* neighbourhoods is to provide an immediate reservoir of marriage partners? Does this requirement not also provide a motor for landscape colonization and infill, preventing pioneer settlements from stabilizing below the Forge/Dunbar threshold? Such considerations may help to explain some of the more paradoxical features of recorded village colonization processes, such as the early neolithic Linear Pottery culture of central Europe, where typically small communities of pioneer farmers spread the entire breadth of Europe at a rate inconsistent with land exhaustion.

FROM VILLAGE TO CITY-STATE: THE 'DORFSTAAT' MODEL

When the inhabitants of a village exchange marriage partners with neighbouring communities, such exchanges are frequently associated in the ethno-historic record with accompanying dowries of land, stock or other property. Let us envisage a scenario at a very advanced stage of landscape infill, when large, original, village territories have become subdivided into smaller units, and the inhabitants are using the entire bounded catchment to its full extent. A new form of demographic tension could arise, where villages compete over boundary lands and yet need to obtain marriage partners from the same adjacent settlements. Having to give arable land or pasture away to another village might seem to be compensated for through reciprocal land dowries being gained by a village, yet the usufruct or more usually rights over the products from land in another village territory, remote from one's home, are an inadequate substitute for family lands near the village that have now passed partly or wholly into the economy of non-villagers.

In real life, the tension between maintaining the integrity of village lands when population is high and the need to marry out if communities are below the gene-pool threshold, has resulted in a cross-cultural form of 'joking relationship' recorded by ethnographers working in traditional farming societies (for example, Tak 1990). Boys from other villages seeking to court and marry village girls risk ducking in the village fountain and other forms of rough-handling. Villages denigrate their neighbours through nicknames and stereotyping, exaggerating their own community's virtues and importance, in what has been dubbed in the Italian context *campanilismo* (after the symbolic competition between villages to erect bell-towers that put their neighbours to shame). Such recent behaviour represents a milder version of more aggressive competition for resources in earlier periods when state power was less all-embracing in rural areas of Europe. Thus in the Italian

Apennines up until the eighteenth century, villages disputing valuable borderlands practised armed raids against each other.

It might be asked how far the tension between exogamy and territorial integrity is a conscious problem for traditional village societies living at high density in a totally infilled landscape. Susan Freeman, in her remarkable ethnography of the village of Valdemora in northern Spain (Freeman 1968, 1970), provides major insights into this question by contextualizing her small community within the wider cultural anthropology of traditional Spanish villages. The people of Valdemora occupy a small territory in the upland Sierra Morena, squeezed by neighbouring villages on all sides. With a population that historically never seems to have surpassed 200, it has always needed to practise exogamy. Yet the villagers explicitly point this out, bewailing the fact that Valdemora can never grow to become a true *pueblo* – the large village type which Freeman considers to have been dominant in wide swathes of Spain in recent centuries – where populations of 500 to 1,000 or more are largely endogamous and can keep village lands essentially within the community.

Clearly the achievement of a community size of 500 or more offers very special advantages to a village using its traditional territory to the full. Not only does the potential for a predominance of endogamy act to keep the village resources within the control of village members, but this centripetal force gives the village greater scope to manage the village territory as a communal asset, something which is very necessary when land use is intensive. If land is scarce, the community needs to have the power to reassign it to reflect the fluctuating size and needs of individual families, to systematize communal grazing, and other forms of benevolent interference in the economic life of the village. As we have seen, the growth of population to such a size puts village society well beyond the Forge/Dunbar range of face-to-face social relations, and predicates a transformation of political structure within the rural community.

Such a dramatic transformation in socio-economic structure can be documented in the historic development of European villages, and its outcome forms a central consideration in the ethnography of rural Western Europe. The 'corporate community' is a specific form of village organization in which wide-ranging powers over the disposal of land, animals, and labour are centralized in a village council. Membership of this council is customarily confined to adult male landowners, who often must possess a certain property qualification (a landholding in itself adequate for supporting a family). If we consider that, in many historic village communities, one half or more of the families had less than this scale of holding, and had to supplement their income through sharecropping, labouring, cottage industry and other means, and that in any case women and subadults are automatically excluded from the institution, then we can easily calculate how the numerical constraints required for a face-to-face society may be adapted to allow total community size to break through the 150–200 population limit. If the effective community of power, the village council, stays within the face-to-face range of 150 but represents, for example, only one half of the adult men, and each adult man represents a family of five (to take common averages for historic villages in Europe), the total village community can be as large as 1,500–2,000 people, and can easily solve most of its marriage-partner needs internally. The Forge/Dunbar threshold has been overcome through vertical stratification of power, but in itself the élite group of the corporate community is especially effective if it can remain on the scale of the face-to-face community. The rural anthropology of the west European countryside teaches us that such large, introspective, communities have a changed ethos from their small, relatively undifferentiated, ancestors: in Italy and Spain, for example, inhabitants of the characteristic medium-to-large villages or pueblos talk of themselves as 'villagers by day' when they are out in the fields, and 'townsfolk by night' when the inhabitants participate in the intense social and political life of their nucleated communities.

The famous historical geographer of the early decades of this century, Alfred Philippson, once wrote a seemingly innocuous and esoteric sentence for posterity to solve: why were there so many *poleis* (ancient city-states) in Thessaly, a region of north-central Greece (Philippson 1951: 224)? The significance of this question stems from traditional conceptions about the origins of the ancient Greek city-state. It has usually been assumed that mountainous Greece, with its innumerable small plains separated by rocky massifs and the Aegean sea, gave rise by natural geography to isolated communities of a town-like character, emerging to statehood within their separate micro-environments. That thesis fails completely to explain the abundance of ancient poleis in the vast, open plains of Thessaly. In 1956 a pupil of Philippson, the equally renowned geographer of the Graeco-Roman world Ernst Kirsten, published a lengthy monograph on the history and geography of the Greek city-state, the underlying purpose of which was to provide the answer to Philippson's query. Kirsten's solution was simple, pragmatic, and even today the most convincing one. Rather than focus on the famous and unique historical properties of the Greek city-state, we should seek to understand it as a geographer would, as a form of settlement on a certain size scale and positioned in an associated landscape also of a certain scale. If we take this radical approach we see that the typical Greek polis is small, characteristically no more than a few thousand people, and its bounded territory or 'chora' is typically from 2–3 to 5–6 kilometres in radius. Clearly it is a special kind of village, a large village, and a politically very complex village, but none the less it is essentially a metamorphosis or politicization of the village, which Kirsten therefore termed the *Dorfstaat* or village-state model.

The ancient historian Eberhard Ruschenbusch (1985) has subsequently quantified the proposition: collating all the available information regarding the 700–800 city-states of the classical Aegean world, he found that 80 per cent have territories of a 5–6 kilometre radius or less, and 69 per cent have citizen male populations of 400 on average (perhaps 2,000–3,000 or so people in total). If the territory is as much as 5–6 kilometres in radius, and this is not a consequence of the inclusion of much uncultivable land, it will usually be because, during the transformation of the village to city-state, it has often given rise to, or absorbed, one or two small satellite hamlets. In central Greece and Attica, I have suggested that during the iron age recolonization of the landscape, interstitial settlement crystallized into a network of 2–3 kilometre and locally even 1–2 kilometre radius territories, creating what I have termed 'proto-poleis' or potential village-states (Bintliff 1994; Figs 13.5 and 13.6). In the Aegean as a whole, these were mostly absorbed over time into larger village-states.

Kirsten went on to distinguish a second kind of city-state, which either develops out of the Dorfstaat or is different in origin. These towns are much larger, with populations in the tens of thousands, and territories tens of kilometres in radius. On a scale comparable to medieval European towns, and supported by a network of lesser nucleated settlements within their territory (some of which were formerly autonomous Dorfstaat cities), such city-states are true towns for the geographer, and fit what Kirsten dubbed the *Stadtstaat* or town-state model. Obvious examples are Athens, Corinth, Argos, and Thebes.

What German scholars term the 'Normalpolis' of some two thousand or so inhabitants is generally associated in Archaic to classical Greece with a form of moderate democracy called the hoplite constitution. In this political structure, the dominant share of power in the 'village-state' belongs to a well-defined class of landholders, those of the 'hoplite' status or above (the aristocrats). In general, between a third and a half of the free farming population might possess sufficient land to achieve hoplite rank, the equivalent of an independent farmer with adequate resources for his family and the purchase and maintenance of the armour and weaponry for service in the citizen heavy-armed division (the essential defence force of the city-state).

The comparison between the Greek polis and the 'corporate community' of recent traditional rural Europe is striking, when we consider the village origin and character of the Greek city-state, the hoplite constitution, and the typical size range of the population and its territory. But it goes further, since the Greek polis jealously guarded its territory. Normally land could only be owned by citizens, citizen status was conditional on both land ownership and usually a certain size of estate, whilst Greek cities were totally male-orientated in inheritance rights. Thus it was possible and not unusual for females from other states to marry into the polis, but normally impossible for males to do so. The polis was also usually large enough to have in any case a high rate of endogamy. These widespread mechanisms ensured the territorial integrity of the hereditary male landowning community which constituted the essential core of the Greek city-state.

If Kirsten provided the central explanation of the high frequency and small scale of the typical ancient Greek city-state, we can now provide a mechanism to account for the 'politicization' of the village into the form of the miniature state: the 'corporate community' arises amongst a dense, mature, network of villages as a solution to social and gene-pool constraints in circumstances where communal land management is essential.

We are beginning to document the stages of development of this process of village-state formation in Greece, and the subsequent transformation of a small minority of these into town-states. In the Early Iron Age or Geometric period, population density is low, and the characteristic form of settlement is that of village or hamlet communities with a large territory, dispersed widely across the landscape. By the classical period, village fission has infilled the entire cultivable landscape with more closely packed and modular village territories, the average catchment being a 2–3 kilometre radius (Fig. 13.5). Many of these villages have been transformed into tiny states or poleis between Geometric and classical times, but increasingly the larger communities are absorbing surrounding smaller neighbours – villages or small poleis – into larger territories dominated by a medium-sized polis. During the fourth century BC in Boeotia, finally, the largest regional settlement, Thebes, which may have remained a small town throughout the Early Iron Age, achieves total dominance over all other poleis in the region as a Stadtstaat.

In the neighbouring Greek province of Attica (Fig. 13.6), this cumulative process must have occurred much earlier. By the time we get our first full picture of rural life in the region, the final Archaic era, as a result of the very detailed village distribution revealed to us through the political reforms of Kleisthenes in the late sixth century BC, the 139 listed village communities all belong to a single state – that of the city of Athens, already a true town of over 10,000 inhabitants. In the outer rural areas, however, the villages still retain a 'stable' territory of around 2.5-kilometre radius, whilst in the countryside around the precociously large true town of Athens the average territory has a 1.7-kilometre radius (strikingly similar to our ideal subdivision of 2.5-kilometre radius territories). The estimated populations of these small urban hinterland villages are surprisingly large, often nine hundred or so people, further indication of high demographic pressure, and it is unsurprising that from this time onwards Athens requires regular food imports to feed its population, as well as sending out frequent colonies ('cleruchies') and developing a far-flung empire.

The transformation from small, relatively egalitarian, hamlets into large villages with corporate community organization and a bias towards endogamy and a highly territorial approach to resources, may be a tendency which is latent in many evolving settlement systems of agriculturalists. I suspect this model could be helpful in explaining the rise and nature of the numerous, small city-states of the Levant in the Early to Middle Bronze Age, as well as the extraordinary profusion of hill-fort focused communities found throughout Europe in the Iron Age, whose distribution in space is comparable to early modern village-hamlet networks. Possibly it may help account for the rise in the Near East and Balkans, even in pre-pottery and early neolithic times, of unusually large and seemingly complex villages, such as Çatal Hüyük, Ain Ghazel or Knossos.

THE ORIGINS AND DEVELOPMENT OF THE MEDIEVAL VILLAGE COMMUNITY IN WESTERN EUROPE

It is widely agreed that the typical early medieval rural community in western Europe was very small, with plentiful resources. Population rise throughout the period AD 500–1000 occurred through settlement growth, fission and landscape infill. In more detailed regional databases, such as those we illustrated earlier for ninth-century Brittany or eleventh-century England, the countryside is already heavily settled, but there is still room for further, internal community growth. The on-average 3–4 kilometre radius territories of the Breton 'plebes' (Fig. 13.4) will be subdivided in medieval and post-medieval times to accommodate almost as many new parishes. Provisional calculations of ninth-century village populations suggest, though, that already the average community was well above the Forge/Dunbar face-to-face society and probably large enough for a predominance of endogamy. Predictably, there exists already at this date a highly organized village council (Davies 1988). In contrast in England some two centuries later, the Domesday Book reveals the dominance of villages and hamlets that lie within the parameters of a 'face-to-face' society. Instead of the doubling of village numbers, the English trajectory in the twelfth and thirteenth centuries is the doubling or trebling of average village populations, thus taking the typical village into the model already achieved in ninth-century Brittany. The eleventh-century population of England may have been in the order of 2.5 million, but according to Brian Roberts (pers. comm.) a figure of 7 million by 1300 is not unreasonable. On the ground, the ultimate product of these two different settlement transformations will end up looking very similar: large rural communities, usually well above the 100–200 person range and not infrequently at or above the 500 range, existing within catchments tending to two of our spatial geometry modes, the 'stable' 2–3 kilometre or 'pressurized' 1–2 kilometre radius.

Brittany is thus precocious in terms of village size, and the English pattern of slower growth beyond the 'face-to-face' scale seems to be more typical of western Europe as a whole, where the five centuries from *c.* AD 800 to 1300 have been broadly summarized as a fundamental *moyenne durée*, or an era of 'medium-term historical process', characterized by the transformation of the small rural settlement into a larger and more complex form – the Corporate Community. The reasons for political change are already familiar from our preceding discussion, but the activity of medieval village councils in adapting to a very high pressure of population on land manifested itself in a unique and very striking fashion, through a complete refashioning of the landscape over vast areas of western Europe (Fox 1981, 1992).

For centuries after the collapse of Roman rule, farming families in the typical hamlet or small village were able to open up holdings in any convenient part of its territory and graze their stock over the broad uncultivated zones. As village populations rose beyond the Forge/Dunbar threshold, fission allowed surplus population to infill neighbouring zones or more distant woodland and waste. Yet population growth continued, doubling or trebling average rural community size between early and late medieval times. Just as the social community had to adjust towards an internally stratified political management, so also the economic basis of the village could no longer exist on the basis of each family farming where it wanted and grazing at will; land and pasture were now too precious. The most obvious difficulty was to control grazing land so that animals were kept away from the key arable fields. The animals themselves were essential to the village economy for complementary products, fertilizing manure, and as a vital source of traction for ploughing and transport of rural production.

Pressure for radical restructuring of the village landscape came from parallel and related changes in levels of power above the individual village community. In the early medieval period in many regions of western Europe, clusters of hamlets or villages, often contiguous, were linked into a network of estates belonging to lords, royalty or the Church (Aston 1985; Blair and Sharpe 1992; Everitt 1986; Hooke 1988; Fig. 13.10). The estate centre tended to be one of the earliest villages, and predictably occupied one of the most fertile districts in each region. Subsequent colonization produced a group of smaller communities in less developed landscapes. Although these satellite hamlets might be expected to produce much of their own food, the estate owner stimulated their surplus production of complementary products for export to the estate centre; this might be barley, wood, animal products, and indeed the multiple estate might be run so that animals were moved around between different village territories to make optimal use of the abundant uncultivated lands.

In the later Middle Ages, however, this kind of economy gave way to a much more intensive and individual village-based approach. In a high proportion of cases in predominantly arable landscapes, each village became an individual estate of a particular landowner, and he or his bailiff resided within its catchment. Even where landowners retained many villages in their estate, they were now managed with greater emphasis on self-sufficiency in a broad range of crops and stock. The reasons for these general shifts in the medieval economy lie in a nexus of changes: growing populations were sustained by taking into cultivation an ever greater sector

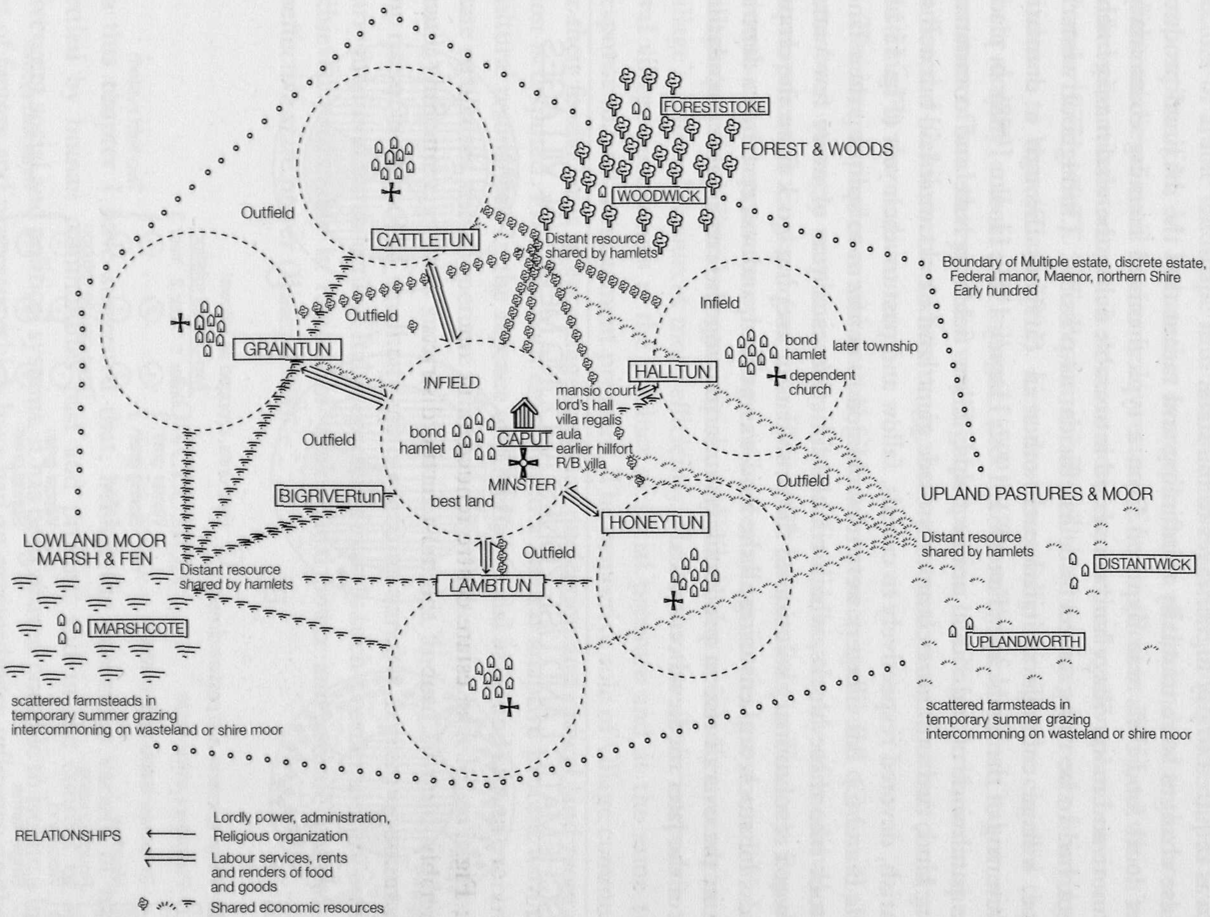


Figure 13.10 The relationships and arrangements within a theoretical multiple estate. Source: M. Aston.

of the village catchment, reducing land which could be devoted to specialist production such as woodland or pasture; social changes broke up large estates in which the Church and the king were often the original landowners, and a new class of local lords was required to pay higher taxes to the state.

These changes were mutually reinforcing and meant that the maximal production of local foodstuffs was required from a typical mixed farming community. With more and more village land converted into arable fields, the vital management of stock had to be reorganized to be as efficient as possible. Throughout western Europe, village councils imitated each other in carrying through a dramatic restructuring of the landscape (Fox 1981, 1992; Harvey 1989; Hooke 1988): in place of the patchwork of individual arable fields, fallow fields, private and communal grazing land, two and more commonly three giant land blocks were laid out across the parish, devoted respectively to cereals, fallow and pasture each year (Fig. 13.11: models B and C). All villagers were now obliged to conform to splitting their land and stock into these blocks, which rotated function each year or every few years. This was a revolutionary solution to the problems of keeping stock from the crops, of access for stock, and ensuring all the land was worked, and was certainly a central factor in the overall rise in productivity underpinning the remarkable population boom of the later medieval centuries.

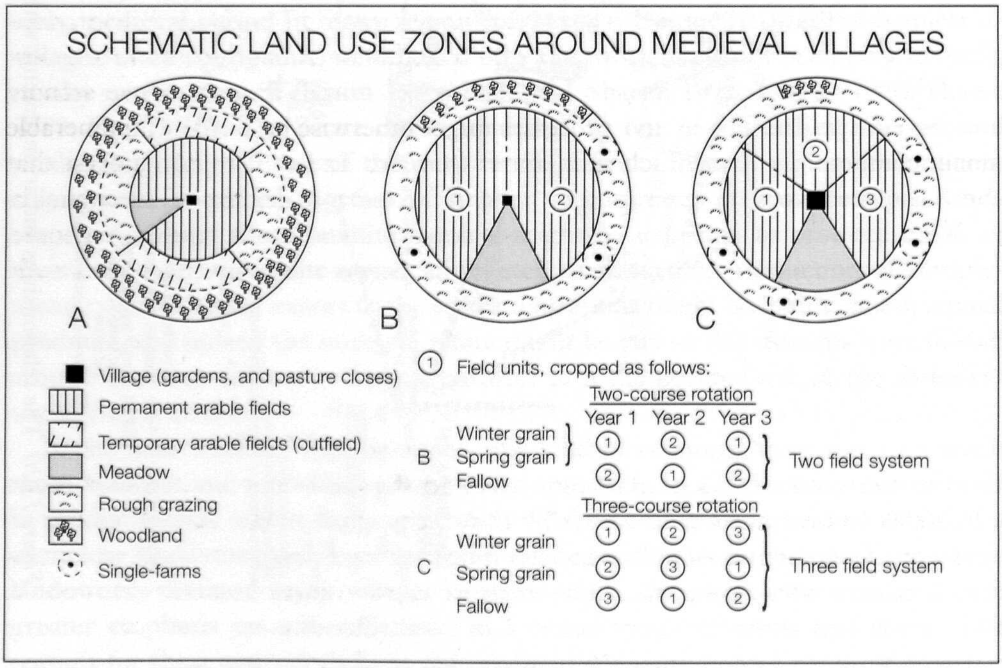


Figure 13.11 Schematic land use zones around medieval villages. Source: Roberts 1977.

Opinion is divided over the feasibility of sustaining such high rural populations, and it is certainly the case that from the late thirteenth century onwards, the trend was reversed, with widespread village abandonments and the conversion of large sectors of arable landscape into less intensive pasture economies. It was a central proposition of M. M. Postan that overexploitation of the land led to the breakdown of the medieval rural economy in western Europe (Postan 1975), to which can be added climatic deterioration in more westerly, northerly, and upland environments (Lamb 1977: 449ff.). The Postan thesis still has strong adherents bringing new evidence to bear (Clark 1992). Less controversially, it might be claimed that the sheer density and size of villages, and the intensity of land use, taken with the partition of land that placed a very high proportion of village territories in the non-buffered 1–2 kilometre radius range, betray a rural economy that could not be sustained in the medium term.

The interdependence and mutual feedback between social and economic process have been strongly emphasized by Harold Fox in his theory of medieval village development in England (see also Bois 1992 for parallels in France). Population growth creates pressure on village resources as territories grow smaller. Larger villages require political reorganization, and this is also necessary to reorganize the village's internal resources more efficiently. Hence the rise of the corporate medieval village community is the product of social pressure and at the same time a response to land management pressure. The respective role of village communities or their feudal lords in encouraging village nucleation and radical land reorganization is disputed. Probably both encouraged a natural adaptive process with cross-cultural resonances. In the absence of powerful feudal lords and strong overarching state structures, these repetitive processes might otherwise have led to innumerable small, competing, polities such as in ancient Greece. Indeed I would suggest that the rise of hundreds of small city-states claiming variable degrees of autonomy in early medieval north-central Italy represents exactly such a contemporary outcome, achieved predictably in regions of weak feudal power and remote and relatively ineffective state power (Waley 1988).

CONCLUSION

In this chapter I have suggested that, behind the enormous variety of habitats settled by human communities past and present, and in the context of widely divergent social and political systems, it has been proved possible to isolate a limited set of factors and processes which have had an extraordinary influence on the size, spacing, and socio-economic organization of rural communities. I have argued that none of these factors is unavoidable in settlement history, and in none the less seeking to account for their remarkable prevalence I would prefer to banish any trace of determinism through an appeal to the new science of complexity (Lewin 1993). Within this grouping of theories, semi-autonomous variables clustered into interactive ensembles are probabilistically likely to be drawn into stable configurations of complex behaviour. In the terminology of chaos-complexity theory, our recurrent factors are the so-called 'strange attractors' or gravity-forces that continually pull the development paths of human settlement history into their sphere of operation.

ACKNOWLEDGEMENTS

This chapter has benefited from the advice and criticism of Geoff Bailey, Bob Layton, and Brian Roberts.

REFERENCES

Aston, M. (1985) *Interpreting the Landscape. Landscape Archaeology in Local Studies*, London: Batsford.

Beresford, M. W. and St Joseph, J. K. S. (1979) *Medieval England. An Aerial Survey*, Cambridge: Cambridge University Press.

Bintliff, J. L. (1981). 'Theory and reality in palaeoeconomy: some words of encouragement to the archaeologist', in A. Sheridan and G. Bailey (eds) *Economic Archaeology*, Oxford: British Archaeological Reports, International Series 96: 35–50.

Bintliff, J. L. (ed.) (1984) *European Social Evolution: Archaeological Perspectives*, Bradford: University of Bradford Press.

Bintliff, J. L. (1986) 'Archaeology at the interface: an historical perspective', in J. L. Bintliff and C. F. Gaffney (eds) *Archaeology at the Interface: Studies in Archaeology's Relationships with History, Geography, Biology and Physical Science*, Oxford: British Archaeological Reports: 4–31.

Bintliff, J. L. (1991) 'Post-modernism, rhetoric and scholasticism at TAG: the current state of British archaeological theory', *Antiquity* 65: 274–78.

Bintliff, J. L. (1993) 'Why Indiana Jones is smarter than the post-processualists', *Norwegian Archaeological Review* 26: 91–100.

Bintliff, J. L. (1994) 'Territorial behaviour and the natural history of the Greek polis', in E. Olshausen and H. Sonnabend (eds) *Stuttgarter Kolloquium zur Historischen Geographie des Altertums*, 4, Amsterdam: Hakkert Verlag: 207–49, Plates 19–73.

Bintliff, J. L. (1995) '"Whither Archaeology?" revisited', in M. Kuna and N. Venclova (eds) *Whither Archaeology? Papers in Honour of Evzen Neustupny*, Praha: Institute of Archaeology: 24–35.

Bintliff, J. L. (1997) 'Regional survey, demography, and the rise of complex societies in the ancient Aegean. Core-periphery, neo-Malthusian, and other interpretive models', *Journal of Field Archaeology* 24: 1–38.

Blair, J. and Sharpe, R. (1992) 'Introduction', in J. Blair and R. Sharpe (eds) *Pastoral Care before the Parish*, Leicester: Leicester University Press: 1–10.

Bois, G. (1992) *The Transformation of the Year One Thousand*, Manchester: Manchester University Press.

Bylund, E. (1960) 'Theoretical considerations regarding the distribution of settlements in inner North Sweden', *Geografiska Annaler* 42: 225–31.

Chapman, J. C. (1989) 'The early Balkan village', *Varia Archaeologica Hungarica* 2: 33–53.

Chisholm, M. (1962) *Rural Settlement and Land Use*, London: Hutchinson.

Clark, G. (1992) 'The economics of exhaustion, the Postan theory, and the agricultural revolution', *Journal of Economic History* 52: 61–84.

Clarke, D. L. (1972) 'Models and paradigms in contemporary archaeology', in D. L. Clarke (ed.) *Models in Archaeology*, London: Methuen: 1–60.

Davies, W. (1988) *Small Worlds: the Village Community in Early Medieval Brittany*, Berkeley: University of California Press.

Dennell, R. W. and Webley, D. (1975) 'Prehistoric settlement and land use in southern Bulgaria', in E. S. Higgs (ed.) *Palaeoeconomy*, Cambridge: Cambridge University Press: 97–109.

Dodgshon, R. A. (1987) *The European Past: Social Evolution and Spatial Order*, London: Macmillan.

Dunbar, R. (1992) 'Why gossip is good for you', *New Scientist*, 21 November: 28–31.

Dunbar, R. (1996) *Grooming, Gossip and the Evolution of Language*, London: Faber and Faber.

Dyson-Hudson, R. and Smith, E. A. (1978) 'Human territoriality: an ecological reassessment', *American Anthropologist* 80: 21–41.

Ellison, A. and Harriss, J. (1972) 'Settlement and land use in the prehistory and early history of southern England: a study based on locational models', in D. L. Clarke (ed.) *Models in Archaeology*, London: Methuen: 911–62.

Everitt, A. (1986) *Continuity and Colonisation*, Leicester: Leicester University Press.

Flannery, K. V. (ed.) (1976) *The Early Mesoamerican Village*, New York: Academic Press.

Forge, A. (1972) 'Normative factors in the settlement size of Neolithic cultivators (New Guinea)', in P. J. Ucko, R. Tringham, and G. W. Dimbleby (eds) *Man, Settlement and Urbanism*, London: Duckworth: 363–76.

Fox, H. S. A. (1981) 'Approaches to the adoption of the Midland system', in T. Rowley (ed.) *The Origins of Open-Field Agriculture*, London: Croom Helm: 64–111.

Fox, H. S. A. (1992) 'The agrarian context', in H. S. A. Fox (ed.) 'The Origins of the Midland Village', Leicester (Papers prepared for a discussion session at the Economic History Society's annual conference, unpublished).

Freeman, S. T. (1968) 'Corporate village organisation in the Sierra Ministra', *Man* 3: 477–84.

Freeman, S. T. (1970) *Neighbors. The Social Contract in a Castilian Hamlet*, Chicago: University of Chicago Press.

Hallam, H. E. (1981) *Rural England 1066–1348*, Sussex: The Harvester Press.

Harvey, P. (1989) 'Initiative and authority in settlement change', in M. Aston, D. Austin and C. Dyer (eds) *The Rural Settlements of Medieval England*, Oxford: Blackwell: 31–43.

Heidinga, H. A. (1987) *Medieval Settlement and Economy North of the Lower Rhine*, Assen/Maastricht: Van Gorcum.

Hill, D. (1981) *An Atlas of Anglo-Saxon England*, Oxford: Blackwell.

Hodder, I. (1982a) *The Present Past*, London: Batsford.

Hodder, I. (ed.) (1982b) *Symbolic and Structural Archaeology*, Cambridge: Cambridge University Press.
Hodder, I. (1982c) *Symbols in Action*, Cambridge: Cambridge University Press.
Hodder, I. (1986) *Reading the Past*, Cambridge: Cambridge University Press.
Hodder, I. and Orton, C. (1976) *Spatial Analysis in Archaeology*, Cambridge: Cambridge University Press.
Holzach, M. (1979) *Das Vergessene Volk*, Deutscher Taschenbuch Verlag.
Hooke, D. (1988) 'Introduction: later Anglo-Saxon England', in D. Hooke (ed.) *Anglo-Saxon Settlements*, Oxford: Blackwell: 1–8.
Jarman, M. R., Vita-Finzi, C. and Higgs, E. S. (1972) 'Site catchment analysis in archaeology', in P. J. Ucko, R. Tringham and G. W. Dimbleby (eds) *Man, Settlement and Urbanism*, London: Duckworth: 61–66.
Kirsten, E. (1956) *Die Griechische Polis als historisch-geographisches Problem des Mittelmeerraumes*, Colloquium Geographicum Band 5, Bonn: Ferd. Dümmlers Verlag.
Lamb, H. H. (1977) *Climate. Past Present and Future. Vol. 2. Climate History and the Future*, London: Methuen.
Lewin, R. (1993) *Complexity. Life at the Edge of Chaos*, London: J. M. Dent.
Philippson, A. (1951) *Die Griechischen Landschaften* (Edited by H. Lehmann and E. Kirsten), Bd I.1, Frankfurt: V. Klostermann.
Postan, M. M. (1975) *The Medieval Economy and Society*, London: Penguin Books.
Pounds, N. J. G. (1974) *An Economic History of Medieval Europe*, London: Longman.
Redman, C. L. (1978) *The Rise of Civilization*, San Francisco: W. H. Freeman and Co.
Roberts, B. K. (1977) *Rural Settlement in Britain*, London: Hutchinson.
Ruschenbusch, E. (1985) 'Die Zahl der griechischen Staaten und Arealgrösse und Bürgerzahl der "Normalpolis" ', *Zeitschrift für Papyrologie und Epigraphik* 59: 253–63.
Sauerwein, F. (1969) 'Das Siedlungsbild der Peloponnes um das Jahr 1700', *Die Erdkunde* 23: 237–44, Beilagen VI u. VIa.
Sherratt, A. (1981) 'Plough and pastoralism: aspects of the secondary products revolution', in I. Hodder, G. Isaac and N. Hammond (eds) *Pattern of the Past. Studies in Honour of David Clarke*, Cambridge: Cambridge University Press: 261–305.
Tak, H. (1990) 'Longing for local identity: intervillage relations in an Italian town', *Anthropological Quarterly* 63: 90–100.
Vita-Finzi, C. and Higgs, E. S. (1970) 'Prehistoric economy in the Mt. Carmel area of Palestine: site catchment analysis', *Proceedings of the Prehistoric Society* 36: 1–37.
Waley, D. (1988) *The Italian City-Republics*, London: Longman.
Wilkinson, J. C. (1983) 'Traditional concepts of territory in southeast Arabia', *Geographical Journal* 149: 301–15.
Wobst, H. M. (1974) 'Boundary conditions for paleolithic social systems', *American Antiquity* 39: 147–78.
Wobst, H. M. (1976) 'Locational relationships in palaeolithic society', *Journal of Human Evolution* 5: 49–58.

SELECT BIBLIOGRAPHY

Susan Tax Freeman's wonderful Spanish village study (1970) from the ethnographic present is admirably complemented by Wendy Davies's remarkably rich portrayal of early medieval villages in Brittany (1988). Harold Fox's exciting model for the evolution of English medieval villages into corporate communities as human ecology (1992), sadly remains unpublished, but the groundwork can be found in an earlier publication (1981). Robin Dunbar has recently produced a volume on his stimulating theories for human social evolution (1996). I have tried to bring together the concept of the corporate community, human ecology, and rural settlement geography in my extended paper on the ancient Greek city-state (Bintliff 1994), which was initially inspired by the neglected and obscurely published masterpiece of Kirsten (1956).