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20. The concepts of 'site' and 'offsite' archaeology in surface artefact survey

John Bintliff

INTRODUCTION

All regional field surveyors now admit that OFFSITE ARCHAEOLOGY (OSA) exists. But reactions to it vary. Some admit its existence but revert to the 'site definition game' as the aim of surface survey. Others sample the landscape and try to separate sites/OSA by mathematical means.¹

Yet as almost every paper in the excellent volume *Interpreting Artefact Scatters* (Schofield, 1991a) makes clear, the question of recognizing what constitutes a surface 'site' is inseparable from the recognition of how the entire artefactual landscape has been put into existence in all its variety and complexity. Only an holistic analysis of the subtle variation in surface artefact density across the landscape can lead, at a secondary stage, to the delineation of potential structure in the data, which at a third stage allows inferences concerning a range of past activity residuals in which 'permanent settlement' is just one of many options for interpreting surface phenomena of a particular density or extent. OSA is not something to be distinguished from site archaeology then safely ignored, nor is OSA ever straightforwardly divergent in character from all forms of activity foci or 'sites'.

WHY STUDY OSA?

Allowing for the universal existence of OSA, why should all field surveyors pay detailed attention to it? Here I can only underline the general opinion of the experienced contributors to *Interpreting Artefact Scatters*, where an attitude towards OSA that treats it as a different focus of discussion from the archaeology of surface 'sites' is roundly criticised as outmoded and unhelpful (see especially Allen on the concept of 'the continuous archaeological landscape'). It is necessary to restate the critical arguments here. The field surveyor coming fresh to a survey landscape should have no preconceived model of density levels and their meaning. Before any consideration of 'the site' has to

come the analysis of the inclusive archaeological landscape. In my opinion, the surface of all regions of Southern Europe that await intensive survey has to be treated as a *terra incognita* even where excavations, standing buildings and extensive survey have given the appearance of a well-researched and understood landscape. I challenge this latter assumption – relying on the known extensive knowledge can be a recipe for failing to uncover unexpected details of the surface archaeology. It needs perhaps little repetition but I shall do so to reinforce the implications of this situation: only on the basis of the empirical presentation of highly-detailed maps of surface artefacts across a region can we begin to analyze the behaviours (including permanent occupation as only one variable) that gave rise to such distributions.

ARE SURVEY METHODOLOGIES GETTING BETTER?

There are times when I feel that we are only just beginning to understand the complexity of surface artefact scatters. The one thing we do know is that surface scatters are never homogeneous – they are the product of multiple human and natural behaviours (Schiffer's [1987] C and N transforms). There can never be (pace Keay and Millett, refs. in Note 1, and others) a magic formula which cuts through the complexity of the data to create simple entities such as '[settlement] sites', leaving everything else as uninvestigated 'offsite'. To operate such a formula merely fools the surveyor into a false sense of security based on circular reasoning.

Although Barker and Symonds (1984: 287) wrote hopefully over ten years ago: 'All survey archaeologists are aware that the amount of surface archaeology they locate is dependent on a complex set of variables which includes the amount of vegetation, the state of ploughsoil, light conditions, and the experience of the personnel. In the Biferno valley survey, for example, some Roman tile

scatters "came on and off like traffic lights" , there is very little sign that since this was published, more recent, even ongoing surveys are aware of this and have adapted their methodologies accordingly!

SURVEY AND SAMPLING STRATEGIES

One area of methodology which seems to be inadequately understood even by current survey projects, is that of sampling strategy. Because we cannot begin a regional survey with a 'control population' to base a sampling strategy on, the urge to take shortcuts in methodology via some supposedly 'representative sample' must be resisted at every opportunity. I therefore cannot support transect strip surveys where thin lines of information are separated by thick lines of ignorance, or transects where data are only collected from 'spot samples' at set intervals (say every 50, 100 or 200 metres) (cf. Coccia and Mattingly, 1992: 222–3, for the same point). If we do not know the structure of the surface data, what grounds do we have for putting any reliance on the representativity of thin transect samples or spot samples across the landscape? The following sequence of figures illustrates what I mean:

Figure 20.1 from the Ager Tarraconensis survey (Carreté *et al.*, 1995) shows what we would now have to consider as poor practice. It demonstrates the sampling strategy across the entire city region, with the fields actually walked shaded in black. A first criticism is that the thin transect strips are unlikely to reveal the complexity of a 2-dimensional settlement system and its correlated spacings. Secondly, we learn that out of the total area of the mapped sample strips (more than 50 km sq) a mere 11 sq km was actually fieldwalked (the shaded areas), producing a highly uneven cover of landscape even within the arbitrary strips. Finally one might add that the strategy employed here – using whole fields as the normal unit of study, removes one's ability to detect trends in density from site cores through haloes to variations in offsite activity. Best published practice: the Nemea (Alcock *et al.*, 1994) and N.W. Keos (Cherry *et al.*, 1991) surveys in southern Greece, the latter shown in Fig. 20.2. Here we can see a large block of contiguous territory as the survey sample, of which a very high percentage has been intensively fieldwalked.

The only improvement I would suggest to these last two examples is to survey in standardised transect blocks to facilitate rapid computerisation (rather than using irregular modern fields) and ensure the most accurate comparisons of surface density across all field survey units (cf. the Hvar and Hyettos survey grids in Figs. 20.3–5).

Let us consider the evidence that sampling strategies such as thin survey transects are potentially or actually misleading.

I will start with the famous 1/5th sample of the island of Melos, where a series of narrow, 1 km-wide strips was laid in parallel across the island, only one in five being fieldwalked (Renfrew and Wagstaff, 1982). It has long

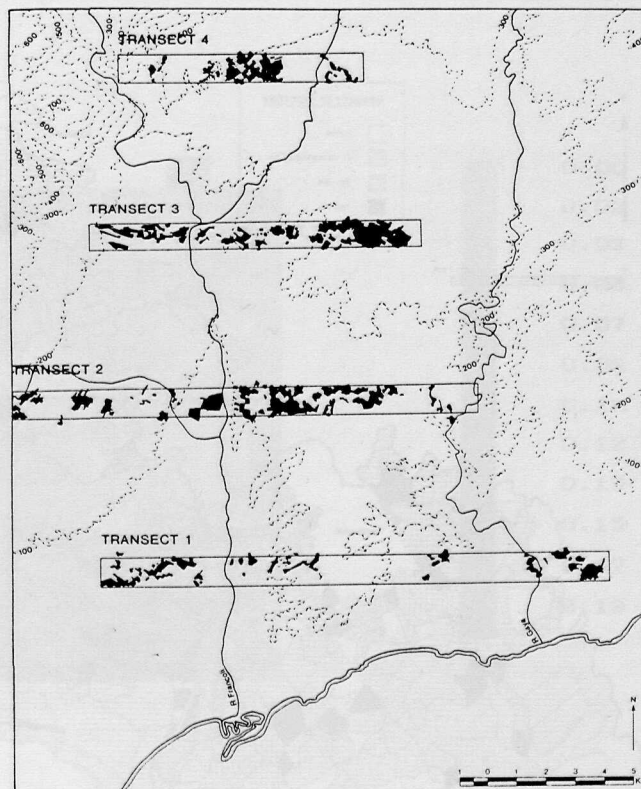


Fig. 20.1: Ager Tarraconensis survey (Carreté *et al.*, 1995).

been apparent (Bintliff, 1984) that such a sample of the landscape works well if settlement/activity patterns are made up of highly numerous foci distributed uniformly across the island's surface, but if population becomes nucleated, you have only a 1 in 5 chance of detecting such nucleations. In this case the major Bronze Age urban centre at Phylakopi in the north-east of the island might well have remained undetected by such a survey, had it not been found through extensive survey last century; without Phylakopi – or the Classical town of Ancient Melos in the north-centre of the island – the development of the island becomes incomprehensible.

Curiously this fundamental weakness in strip-transect sampling was exposed long ago by Stephen Shennan's testing of transect methodology against the modern settlement map on his East Hampshire Survey (Shadla-Hall and Shennan, 1978: 95); 20% transect sampling found a representative sample of the modern farms but missed the only town in the district. The implications of the omission of the giant city of Teotihuacan from a sample survey of the Valley of Mexico were discussed even earlier (and with great humour!) by Kent Flannery in *The Early Mesoamerican Village* (Flannery, 1976: 131–6).

A second example of the dangers of small strip (or its alternative, dispersed box) samples for representing landscapes, where most of the landscape remains unresearched between the sample units, comes from my own recent survey

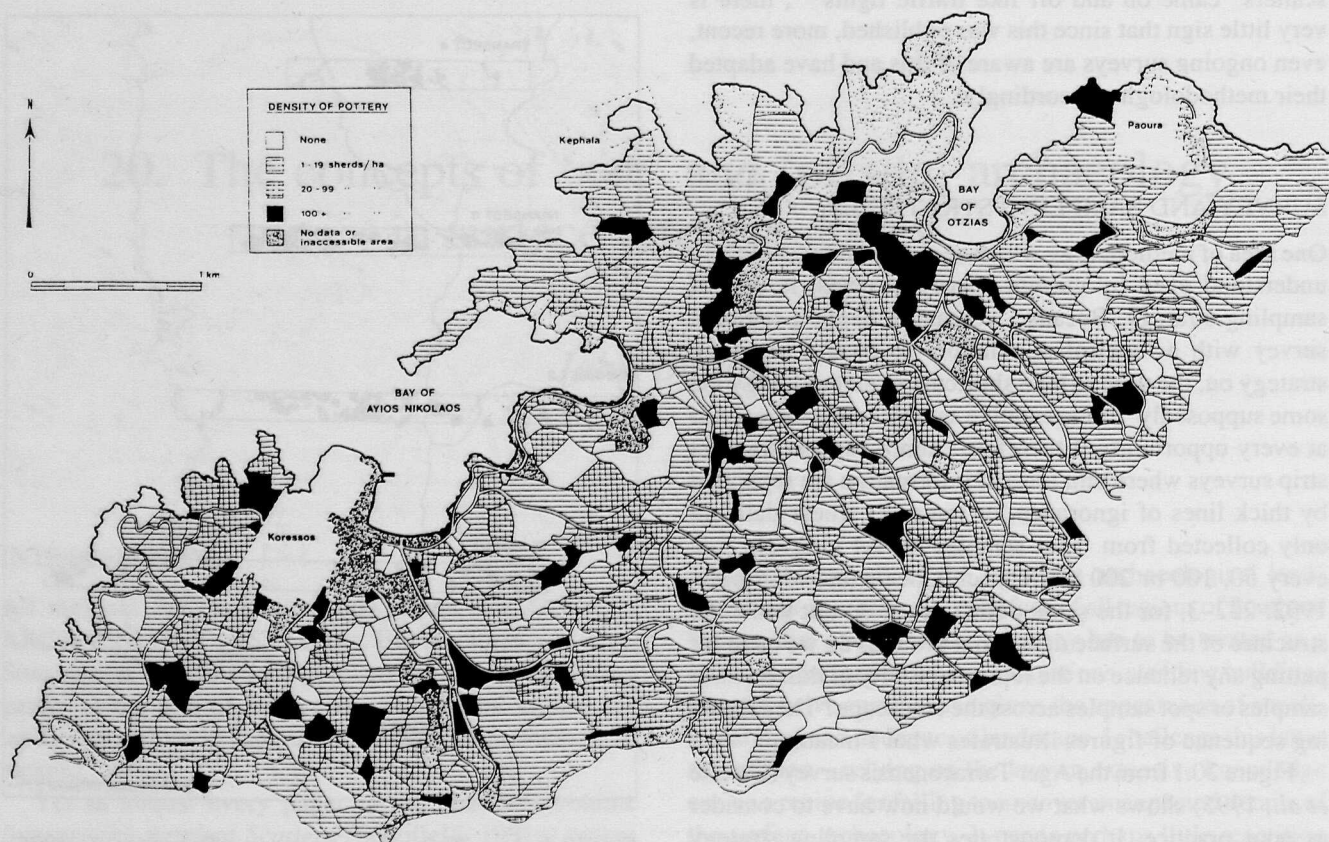


Fig. 20.2: The density of pottery (expressed in sherds per ha) in tracts in the survey area.

experience. This is evidence emanating from a very small sector of the Boeotia Survey in Central Greece.

The fate of the population of the ancient city of Hyettos, in north Boeotia, after the end of Antiquity, and that of its rural hinterland, were still a complete mystery even after French archaeologists had compiled an extensive survey of the site and collated its historical record (Etienne and Knoepfler, 1976). Nothing could be said after the last references to the town in the 6th century AD, until the first appearance of local villages in travellers' accounts dating to the Early Modern period.

It was a fortunate decision that towards the end of the Boeotia Project's ten-year programme of fieldwalking, we took a conscious step to open up an entirely new zone of the province to intensive survey. The ancient city of Hyettos and its territory were a considerable distance from, and geographically quite-contrasted to, the extensive sector of south-west Boeotia where we had concentrated our fieldwalking during the preceding seven years. Subsequently, over three seasons, we were able both to survey the entire surface of the city and several square kilometres of its surrounding countryside, as a control sample over the results achieved from some 50 square kilometres of rural and urban survey in southwest Boeotia.

The city of Hyettos did indeed appear to lose occupation

in the 6th–7th centuries AD, with limited reoccupation only much later in the High Medieval period. More interesting however for our present purpose were the results of the countryside survey: apart from a dense scatter of Classical Greek farms and Roman villas (predictable from our survey work elsewhere in Boeotia) – whose distribution might well be amenable to a 20% survey, one particular small district of little more than 500 m in breadth provided information about the post-Roman sequence in this region that only 100% fieldwalking cover could have hoped to detect.

No less than five discrete medieval settlement sites have been found in a chain from west to east across this small distance (Fig. 20.3), each apparently representing a specific unique phase in settlement history as well as evidencing overlaps to each other; the entire sequence should begin not long after the abandonment of the city, in the 7th–8th centuries AD and continues up to the late 19th AD centuries. Potentially the associated ceramic assemblages are without parallel in Greece. Given the scarcity of early medieval sites in Greece, and the small size of these particular sites, the chances of recovering such a complete sequence using transect or box sample survey are infinitesimal.

For these reasons I believe that large continuous blocks

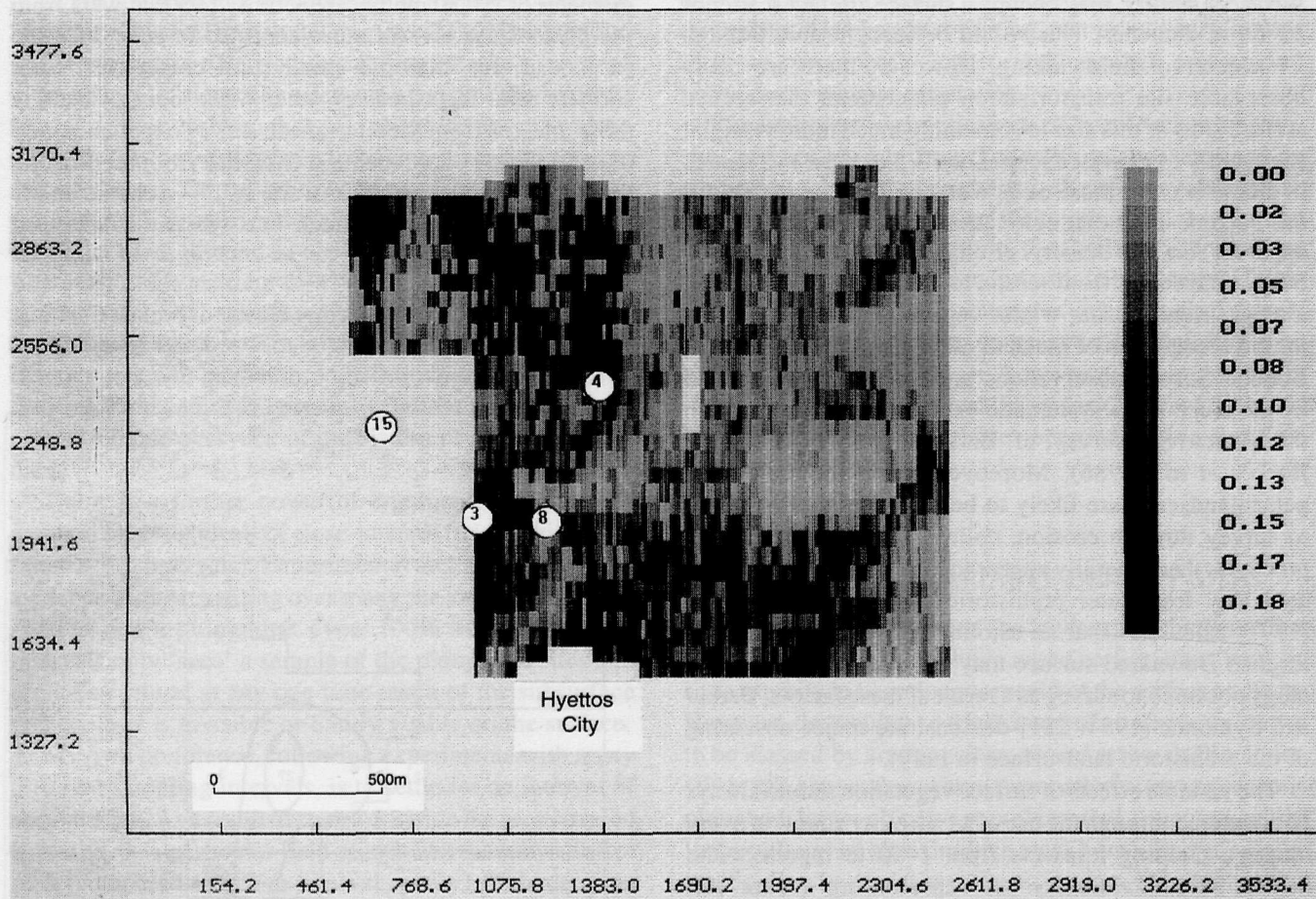


Fig. 20.3: Hyyetos survey.

of landscape are the minimal units for surface survey. Ideally these should be sufficiently large to include several contiguous *Siedlungskammer* (districts large enough to support a village settlement), where the vicissitudes of settlement relocation and variations in land use within natural settlement districts are likely to be picked up.

With the exception of built-up areas and other inaccessible sectors, these contiguous areas should be 100% fieldwalked, whilst within them surveyors need to record surface data continuously rather than at arbitrary intervals. This means counting surface artefacts (with manual 'clickers', for example), and collecting in a line a physical sample of the visible material from every transect walked. Given the weight and quantity of Greco-Roman tile that the Mediterranean landsurface often reveals, it may be necessary to count tile *in situ* and confine collection to non-tile artefacts, or collect sample corners of tile pieces.

In advising on intervals between fieldwalkers, we confront once more the problem of sampling. Since a complete 'eye-cover' of the landsurface would require walkers at as little as 1 metre intervals, the prohibitive slowness of such a procedure would prevent an aspiring regional survey from covering more than a single commune. It is generally accepted therefore that what is actually 'seen'

by fieldwalkers is some form of representative sample. As for the limitations of this partial inspection of the landsurface, here at least we have some empirical evidence to assist our decisions.

For field manuring scatters, or site discard 'haloes' produced by deliberate disposal of settlement refuse around and outside of settlement sites (often also for manuring purposes across gardens), the spatial scale of the phenomena is wide and this should allow adequate recognition and recording from surveyors spaced at 10–15 m intervals. But when we turn to the recognition of activity foci – there is no doubt that intervals greater than 5 m produce information loss.

I need to elaborate on this last point. Basically there are two major kinds of activity focus that may create surface traces across an area smaller than 20–30 metre diameter. One is a vestigial surface site, formerly, or potentially, a much larger surface site. The other kind is a group of sites that even under ideal surface conditions is smaller than a 20–30 m diameter circle.

Let us start with vestigial site scatters. There is growing empirical evidence that a small farmsite in the later prehistoric, ancient and medieval periods in the Mediterranean, under suitable conditions of cultivation and

surface visibility, may occupy a surface artefact scatter of 20–30 m diameter. This would be recognisable through 15 m-interval fieldwalking. However, there are many observable site transformation phenomena that reduce surface sites of this size to something much more vestigial (frequently to a surface scatter of 10, 5 or even 1–2 metres in diameter). For those of us who regularly revisit sites it has become clear that cultivation processes can alter the apparent size and density, or otherwise obscure and even bury surface sites from season to season, and even within a single field season, whilst vegetation cover can often inhibit recognition of much or all of a small site (our own Boeotia Survey observations are completely confirmed by the much more systematic experiments carried out on the Montarrenti survey, cf. Barker and Symonds, 1984; Barker *et al.*, 1986). Moreover, some sectors of the palaeolandscape are likely to be permanently ‘invisible’ to survey through erosion, colluviation and alluviation, processes that generally appear to have acted in an accelerated way from later prehistoric times onwards (Allen [1991] calculates that an astonishing 1/5th of the south English Downland surface may have its surface archaeology obscured to survey as a result of these factors; Barker and Symonds [1984: 281] demonstrate major obscuring of the prehistoric landsurface in Italy).

The variable effects of surface vegetation should always be countered through the use of a ‘visibility count’ in every transect. Grading transects from 1–10 to represent the degree of soil visibility (10 representing a bare soil completely open to view, 1 a transect where all soil was obscured by surface vegetation) allows the preparation of ‘visibility corrected’ surface artefact density maps of entire landscapes and individual site surfaces. These have proved invaluable in providing more realistic distributions of surface archaeology, and equally more accurate site sizes. This relatively simple method, which we have employed on the Boeotia (Bintliff and Snodgrass, 1985) and Hvar (Bintliff and Gaffney, 1988) Projects, works as follows. A ‘raw’ density map shows the counts per transect of potsherds seen by each fieldwalker. If the ‘visibility’ count in a transect is 2/10 and the pot counted was 4, whilst in another transect there were also 4 potsherds seen but the visibility was 10/10, on the subsequent ‘visibility corrected’ map the first transect is given a pot count of 20, whereas the second receives only 4 sherds. For examples of application, see Figs. 20.4–5:

These figures illustrate the same sector of the Hvar Survey; individual fieldwalkers are at 10 m intervals, with the number representing sherds counted on each 45 m long individual transect; numbers in bold are additional sherds on walls or stone cairns as opposed to the field surfaces. Fig. 20.4 shows ‘raw’ counts on and around a locality that was later identified as a Roman villa site P4. Fig. 20.5 shows a visibility-corrected version of the same map.

As mentioned above, the other class of phenomena where surface scatters can frequently fall well below a

diameter of 20–30 metres are activity foci that were from the time of use always more confined in scale than the farmstead: for example small rural cemeteries, rural shrines, rural farmsheds or other work loci (to mention those attested from Mediterranean survey experience). To illustrate this I could mention two sites from the Boeotia Project, where we can contrast site PP17 – a characteristic family farm of Classical Greek date, where the farmstead plus its surrounding ‘halo’ can be encompassed within an oval some 60x50 metres – with another site a mere 150 metres distant, site PP11 – a tiny cluster of broken Classical

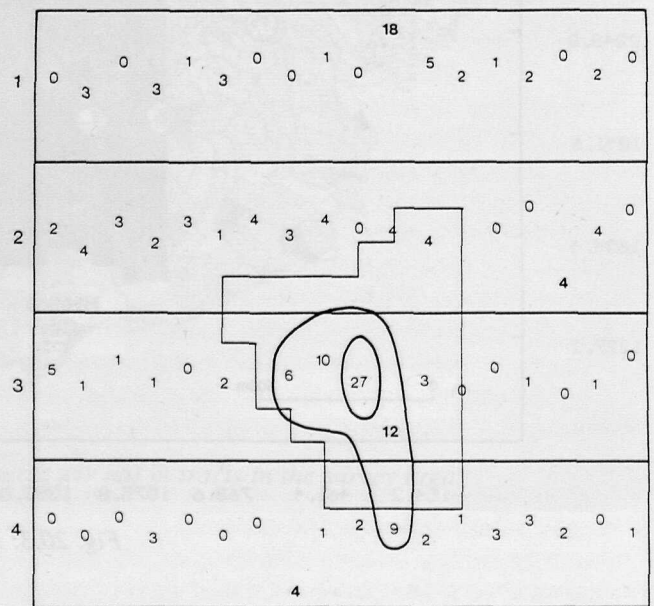


Fig. 20.4: Hvar survey.

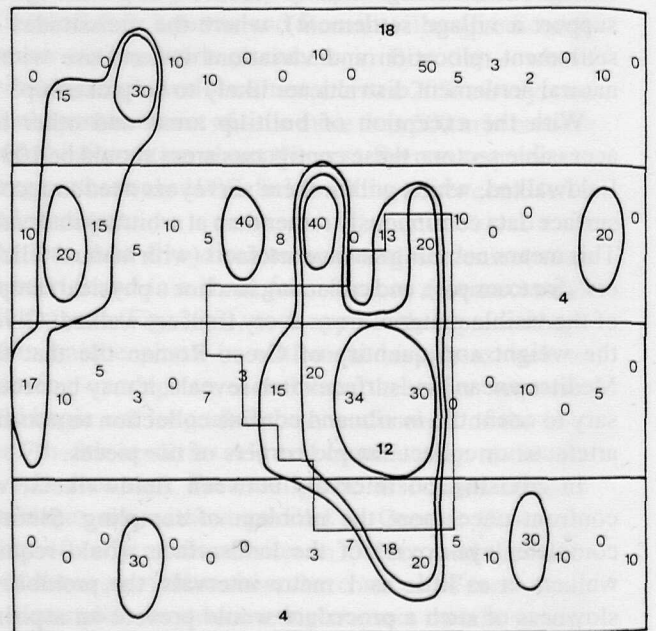


Fig. 20.5: Hvar survey.

fineware confined to a rectangle some 8 metres broad and 25 metres long and interpreted as a small family cemetery.

Clearly surveys carried out at 5 m intervals have far more chance of detecting vestigial sites and the smallest foci of activity, although I see no virtue in such close intervals for the purpose of identifying manuring spreads and site haloes. On the other hand empirical results show that although 5 m interval walking is far faster in surface cover than 1 m interval fieldwalking, it is still extremely slow; over the typical timespan of a Mediterranean survey project – say 3–5 seasons – it results in a very small area being fieldwalked within a chosen survey region. The inherent risk will be that through limitations in the size of the area surveyed, it is very unlikely that the survey will offer a reliable overview of the history of regional settlement.

There is a further powerful argument for not over-emphasizing the 'ideal' of close-interval fieldwalking (5 m or even 1 m intervals). Experimental archaeology and the evidence of site revisiting over many seasons provide good reasons for arguing that even 100% survey at close intervals only 'sees' a sample of the ploughsoil sites and offsite structure; at any one time much of the subsurface archaeology is invisible or barely visible on the surface.

My own preference, following experiments with many different sampling intervals, is to settle for an interval of around 15 m. As a result of such a decision the area covered by survey in a particular field season increases by a factor of 3 (compared to a 5 m interval survey). This decision does nonetheless have varying results on our ability to detect those vestigial sites and very small foci that we have just been discussing. For those site types which the empirical evidence suggests are numerous and spread equally across certain sectors of the landscape, we might feel some confidence in multiplying their number from those seen by fieldwalkers, by the appropriate factor to allow for the landsurface not literally looked at in each transect. Thus the discovery of 5 small cemetery sites by a fieldwalking team spaced 15 m apart and assumed to inspect 1–2 m of ground per walker, might prompt the speculation that some 10 times that number would have been found through fieldwalking at 1–2 m intervals between walkers. On the other hand, the discovery frequency of other types of site would have to be seen as qualitative rather than quantitative information, since we cannot assume an isotropic distribution of all site types across the 'unseen' landscape (e.g. rural shrines).

Fortunately for attempts to reconstruct the general demographic characteristics of a region in any particular phase, the proportion of total population likely to be represented by vestigial sites and sub-farmstead sites is often roughly calculable as a small one (Bintliff, 1997). Moreover one can move to semi-quantitative estimates of the latter's likely original complement through revisiting over a number of years; in Boeotia it is our current suggestion that we should perhaps double the number of hitherto-recorded small family farms of Classical Greek

date to make allowance for those that would be found through total landscape revisiting over many years, as well as those permanently lost to sight through erosion and burial or permanent vegetation.

The interpretative implications of 'seen' versus 'unseen' sites are not trivial. Thus Todd Whitelaw's outstanding ethnoarchaeological research for the Kea Survey (Whitelaw, 1991) has demonstrated that the number and distribution of Early Modern rural farms on the Cycladic island of Kea is far higher and denser than the pattern of Classical farms found in the same island by intensive archaeological survey. Inferences concerning a contrast in landholding size between the two periods are, however, thrown into doubt if we consider the likelihood that many Classical farmsites lie undetected between those recorded during the field survey.

THE PROBLEM OF VARIABLE DENSITY SITES

Close-order fieldwalking of the landscape, whether at 5 m or 15 m intervals, as we have noted earlier, must be done so as to produce a continuous record of the surface artefacts. However, the resultant surface maps of artefacts are known to be biased by artefact class: recent research (Boismier, 1991: 18) shows that where occupation sites are recently ploughed, larger objects are preferentially exposed, whilst longer-ploughed sites produce more homogenized smaller pieces. For the discovery of activity foci, this implies that there may well be a bias towards recognizing freshly-disturbed sites during survey itself. The problem is exacerbated in areas with a strong offsite manuring practice, since manure scatters are also typically represented by homogenized smaller, worn pieces.

This degradation of surface scatters with age has implications for older sites: especially where prehistoric pottery is concerned (with fabrics that can be heavily gritted and poorly-fired), the processes of cultivation and weathering exercise a progressive attack on the number and size of prehistoric sherds, which in turn creates a tendency for prehistoric activity foci to become increasingly invisible to surface survey. Although there are exceptions where the high quality of prehistoric pottery enhances its long-term survival (e.g. Minoan Bronze Age ceramics – hence perhaps the extraordinary density of known findspots on Crete), as a general rule there is cumulative evidence from many regions of Europe that the typical surviving surface assemblage likely to represent a small prehistoric farmsite will be completely contrasted to that of the equivalent unit in Greco-Roman or medieval times. Our experience in Boeotia of such phenomena can be matched by those reported from Italian surveys (Di Gennaro and Stoddart, 1982; Barker and Symonds, 1984: 281, 283).

On the Boeotia Survey we would hypothesize that surface-visible pot density (from a fieldwalker height of 1.5 m) for a typical farm of historic times might amount to several hundreds of artefacts, whilst in contrast a typical

Early Bronze Age equivalent could be represented by a handful of visible pieces (perhaps a mere 1–2). This gross differential by period for activity focus/site recognition, might encourage us to establish some numerical procedure (Keay and Millett, refs. in Note 1), in which a magic formula was conjured up to convert sherd density per period into a definition of site density. Such an operation can, unfortunately, easily be shown to be fallacious through practical experience, although it is at first sight attractive via its ability to 'create sites' in an unambiguous and seemingly 'scientific' way. The apparent ease of distinguishing sites through a simple numerical boundary obscures the otherwise obvious failings of the 'magic formula' approach from its practitioners.

We can expose the erroneous thinking behind 'magic formula' density analysis through the following considerations. Settlement sites or other activity foci that have only recently been fully-exposed to cultivation, or else have been given ideal cultivation treatment for surface exposure, will be far more prolific of artefacts than either long-exposed sites or those treated in other modes of farming less conducive to surface visibility (cf. Stoddart and Whitehead [1991] with reference to the Gubbio survey). Sites with either longer phases of occupation/activity, or use by larger numbers of people at any one time, will also provide quantitatively-different signals from those of shorter/less populous use. Finally sites of divergent function e.g. cemeteries, shrines, animal shelters, permanent settlements, are highly unlikely to provide equivalent artefact density levels to each other.

Evidence of the operation of these problems can be seen both on my own Boeotia Project and on the Neothermal Dalmatia survey Project. In the former case for many years, at the start of the survey season, we took students fresh to fieldwalking to the well-known Bronze Age site of Onchestos. This 'hamlet' site, despite its moderate extent, never failed to provide plenty of surface material to allow novice-surveyors to recover prehistoric pottery collections. In complete contrast, another Bronze Age surface site – Palaeokarandas, when I first encountered it on an individual reconnaissance trip, was a prolific Bronze Age surface site of village character; yet a revisit some years later with a full survey team (but under different cultivation conditions) found it reduced to a low-density, 'farmstead' level of ceramic frequency and surface extent.

Also from my Boeotia experience I can adduce a series of Bronze Age rural sites that were only discovered by chance, evading detection by intensive survey. The occasions of discovery are illuminating. Some were revealed retrospectively through the recognition of small numbers of clearly prehistoric potsherds and flints within the much larger collections that had been made at easily-recognized Greco-Roman sites; this suggests that poorly-preserved prehistoric sites would normally escape detection in their own right, whilst even when coinciding with later site occupation the prehistoric presence may be so

slight that only careful post-survey processing will raise the question of early occupation/use. A very similar phenomenon is recorded by Di Gennaro and Stoddart (1982) for the South Etruria survey.

Another occasion of discovery was through close re-examination of transects for quite other purposes, when areas already fieldwalked were revisited to clarify some detail of the historic site distribution, and in so doing a previously-unobserved prehistoric scatter was observed.

When surface sites have been reduced either permanently, or just seasonally, to low-density, vestigial appearance, secondary on-site analysis may require unusually-exhaustive collection procedures. Thus to take the preceding examples of prehistoric sites in Boeotia, the follow-up to the discovery of a handful of visible prehistoric pottery from 1.5 m height was only successful when we subsequently implemented a groundlevel 'hoovering' of the surface (which is best done from a completely prone position on the ground). The result was a few score pieces from such sites.

As must be clear from these case-histories, whenever we are dealing with sites that cover a spectrum from the highly-visible, dense focus to the permanently/ temporarily vestigial category, the creation of firm site-density levels is highly problematic to impossible. The 1–2 sherd lowest common denominator for the recognition of vestigial sites brings us to such a low density level that offsite or non-permanent-settlement activity cannot be separated numerically from what may be a typical vestigial site density (Clark and Schofield, 1991). Both quantitatively and even qualitatively, the number and condition of sherds on such sites when crossed during primary fieldwalking transects, may mimic genuine non-site/offsite discard; only intensive secondary, on-site analysis can clarify the nature of such low-density occurrences, if they are observed, which I would suggest is the exception rather than the rule.

If, as in Britain (Bell, 1981; 1983), offsite manuring was practised in later prehistory, then the statistical realities would cause us to doubt any formula claiming to distinguish between this phenomenon and that of vestigial prehistoric activity foci. It is exactly here, however, that both secondary exhaustive site study and the analysis of the qualitative structure of finds provide the essential way forward. If, and only if, closer study of these questionable locations using 'site hoovering' reveals clusters of larger, freshly-disturbed fragments emanating from newly-broken-up archaeological deposits can we feel confident in activity focus/ site recognition. One of the Boeotia Survey's Greco-Roman farms, MPA6, produced, retrospectively out of study of its historic assemblage, two fragments of Mycenaean (Late Bronze Age) pottery; on the basis of our previous experience such small quantities raised the unavoidable question as to whether this site was also potentially a small, vestigial prehistoric settlement. Subsequent close 'hoovering' of the site by a Mycenaean specialist, Chris Mee, and a later complete resurvey of the site found not a single further prehistoric fragment, ensuring that an 'offsite'

explanation is without doubt the correct one for the presence of these pieces.

These density variations operate at their extreme with prehistoric sites, but are actually a seriously distorting factor in every historic period too. Careful experiments carried out on the Montarrenti survey (Barker and Symonds, 1984; Barker *et al.*, 1986) show that revisiting of particular sites both in the same field season and over a sequence of seasons rarely finds comparable site densities or site extent to previous or later visits, through variations in land use and weather conditions affecting surface exposure of artefacts.

Another good case-study where the difficulty of operating a site-density formula becomes apparent, is that of the Neothermal Dalmatia survey, in presentday Croatia. On the assumption (which as we have seen cannot actually be sustained) that there can be a single threshold density value allowing us to separate all 'settlement sites' from 'offsite scatters', Chapman and Shiel (1988; 1993) employed a simplified variant of the Keay-Millett 'magic formula' to create 'sites' (in their case any sample area with densities of pottery above the mean in each period = sites in that period).

The application problems this posed may be illustrated by reference to Chapman and Shiel's analysis of the surface finds for the Bronze Age. Since the range of potential activity across the landscape in this phase was not taken into consideration, nor the existence of vestigial or complete site exposures, the whole numerically-based analysis was biased by the existence of 'artefact sinks' – hillfort interiors of trapped soil with high concentrations of pottery. Since only the higher density scatters can be seen as 'sites', these central-places are probably artificially elevating the definition-level of 'site density', leaving the zones of less populous activity elsewhere in the landscape of doubtful status or simply as unclear 'offsite activity' (a problem partially acknowledged by Chapman and Shiel).

Curiously, Chapman and Shiel go on to subscribe to the view I mentioned earlier, that preservation of prehistoric pot in the Mediterranean landscape is poorer than for the Roman and later periods; therefore 1–2 pieces of Bronze Age pottery in a scatter should count for far more in terms of human activity than the equivalent for the Roman era. However, the median density value for Bronze Age finds in the Neothermal Dalmatia survey area was 5 sherds, compared to 4 for the Roman era, placing both pot distributions at a similar level for site definition (actually owing to the bias introduced by 'hillfort sinks' the threshold for recognizing a Bronze Age site was higher than that for a Roman site!).

Turning to the Ager Tarraconensis survey itself, where the concept of an arbitrary 'magic formula' for defining site level density finds its source, the method produces what Keay and Millett (Carreté *et al.*, 1995) themselves admit to be 'nonsense' results; one Late Roman sherd in a field becomes a 'site' since there are many fields lacking any contemporary finds at all. As Clark and Schofield comment wisely: 'Indeed if we concentrated more on the

combination of density and content of surface scatters rather than trying to establish their status merely by density, our interpretations of the settlement system... may appear a little more straightforward' (1991: 102).

LITHIC SURVEY

I have yet to nuance my remarks to the lithic/ceramic differentiation. One should never rely on fieldwalkers themselves to decide which artefacts to bring back – leave that to the pottery experts, but even trained field surveyors cannot easily focus their eyes and hands on both pottery and lithic surface finds. Unless we are dealing with unmissable contrasts such as black, shiny, glassy obsidian in a red-brown soil, most Mediterranean surveyors have admitted that lithics are usually missed through a necessary visual focus by fieldwalkers on objects with a pottery appearance that excludes surrounding stones.

On the Tarraconensis survey the recognition of lithic finds in the field was generally limited to experts (Carreté *et al.*, 1995). The Boeotia Survey has experimented with a lithic specialist walking a parallel transect to the normal field team, where he was required merely to collect stone implements and ignore ceramics; he found 1 tool per hectare compared to an average of zero for the rest of the fieldwalking team. My own feeling at present would be to learn from the latter experience by instituting this as a formal procedure. This would be the best means of creating a more realistic sample of the lithic landscape.

The obvious problem with parallel fieldwalking is equivalence of cover. A single lithic walker would only see a narrow strip of each team transect. Following the arguments presented earlier in this paper, such an approach would be reasonable for mapping general activity levels across the landscape using lithics. But a single lithic walker following a line of some 1–2 metres broad to represent a transect with a frontage of say 100 metres, might well find a poor qualitative sample of activity foci in which lithics dominated.

Bearing in mind my earlier comments on prehistoric coarsewares, this problem of improving recognition of prehistoric activity in general through lithics, brings us back to the associated problem of the contemporary ceramic record. An eye trained to detect historic surface ceramics often misses unpainted coarse prehistoric potsherds; the latter can merge into the surface appearance of the soil whose texture and colour they so often resemble (not surprisingly when usually locally manufactured!). This means that even 'total collection' may miss much prehistoric pottery lying in the ploughsoil. Alongside prehistoric scatters that are easily noted through the size and density of finds (not necessarily a sign of a major site) we have seen that a mere 1–2 pieces of prehistoric material found together could indicate occupation or an activity focus. Only continuous total collection along 1–2 metre-wide strips by each fieldwalker can alert ceramic specialists to

the existence of at least some of the potential low-density foci of this kind; all such that are recognized need to be evaluated by a revisit and very painstaking detective work.

EXCAVATION CONTROL

Some field surveyors suggest that another 'magic formula' to resolve many of these problems of variable surface density can be obtained through period-specific conversion rates for the ratio of surface to subsurface pottery, obtained via excavation below surface assemblages. The idea is to compare the ratio of sherds in excavated levels from one or more sites in your region with the surface density at the same sites, then use the result as a formula for interpreting 'scientifically' other, non-excavated surface scatters. What this hypothesis ignores is the obvious fact that 3-dimensional excavation assemblages are prone to all the same distortions that beset 2-dimensional surface archaeology.

Firstly, geomorphic research and experimental archaeology demonstrate that two sites of similar age and size can give widely-divergent surface manifestations as a result of varying pedological and agricultural histories. Archaeological sites undergo varying histories of erosion, and other forms of natural weathering, ploughdamage, exposure and destruction, so that sites of a similar age may have most of their artefact material deep in the subsoil or most of it in the immediate surface layers (cf. Bintliff and Snodgrass, 1988 with references, and Allen, 1991: 45ff and fig.5.3).

Over large areas of temperate North-West Europe humus accumulation deepens the soil profile from above, attenuating the artefact and ecofact content of palaeosols through an expanding A horizon. In semi-arid climates such as characterize much of Mediterranean Lowland Europe, in contrast, surface soil growth may be limited or even outweighed by soil loss, so that soils grow from below through weathering of the C horizon; the effect on palaeosols and their artefactual and ecofactual content would be to concentrate such evidence into the immediate surface and subsoil. For the latter case I am familiar with a number of test excavations in southern Greece where very rich surface sites of prehistoric date revealed almost no surviving deposits below ground due to erosion (for example, Karaousi in the Helos Plain, Bintliff, 1977: 461). As noted earlier, the vicissitudes of cultivation history will also act to vary the dispersal, size and number of artefacts in the soil.

Secondly, the widely-varying functions of sites and other activity foci lead to great contrasts in the density and discard patterns they give rise to.

For both these reasons – the natural and cultural transforms – it is inconceivable that even for a single period or culture one could erect a 'magic formula' tying surface to subsurface finds in a predictive fashion, or expect to find a surface or subsurface density 'typical' for all foci of a period. Only complex quantitative and qualitative analysis can hope to unravel the fascinating variety in both 2 and 3

dimensions that field survey and excavation uncovers. A good example quoted by Schofield (1991b: 4–5) is the problem of Saxon pottery scatters in England: a small number of settlement excavations have shown low pot densities in dug levels, implying a predictive expectation that surface finds would be extremely rare for field survey recognition. However recent field surveys have found a number of very rich surface sites in rural locations.

ANALYZING THE STRUCTURE OF SURFACE ARTEFACT DISTRIBUTIONS

Up to this point we have argued for parallel, continuous counting and collecting of ceramic and lithic material across entire blocks of contiguous landscape as the ideal circumstances for good data recovery. Attention to visibility correction and physical geographic interference must also be introduced to filter the more obvious biases on the surface distributions obtained. What then are we to make of the often highly-complex artefact distributions that we have now produced, both in total and mapped by individual period?

I want, deliberately, to underline the central message I have just been elaborating: there is no single criterion, qualitative or quantitative, allowing us to isolate localised parts of our surface artefact distributions and term them 'site', 'non-site', 'domestic', 'ritual' etc. – only a multi-factorial approach is valid. What will this mean?

For once I find one point of agreement with the approach of Keay and Millett (refs. in Note 1): the starting point for analysis has to be period-specific distributions: as we noted for the most obvious case above – the finding of 1–2 sherds of prehistoric material together is of far greater potential significance for implying a focus of past human activity than the equivalent number of finds for historic times. Period-specific ceramic study is required to allow for taphonomic conditions varying over time, for alterations in discard behaviour, as well as other changes in cultural/technological behaviour which will include variations over time in the availability and demand for artefacts in a given society.

Yet from this basis of mutual agreement we must part immediately from condoning Keay and Millett's subsequent arbitrary manipulations of period-specific data: as we have been at pains to explain – no magic formula will 'read' the period distribution into simple site versus offsite categories.

'OBVIOUS' SITES AND INTUITION

A first point of discussion is the traditional assumption of surface survey: that the densest concentrations, or residuals, of contemporary artefacts are likely to reflect occupation sites. The supposition is a reasonable one, and such scatters require investigation, after primary discovery through fieldwalking, utilising a detailed grid approach.

But we must never ignore the fact that such 'obvious surface sites' are unlikely to represent identical subsurface phenomena. If, as we might normally expect to be the case with such dense scatters – intensive site analysis confirms a domestic settlement – the 'high-density' visible may be due to longer-use within a particular period, greater population at one specific time, or more favourable cultivation practices/surface vegetation cover for revealing larger quantities of artefacts. Isolating the role of such factors requires detailed on-site research: it may not always be possible in the time available to resolve these possible distinctions, nor may the chronological resolution available for ceramic and other finds ensure an adequate control over occupation-length. It is also not unknown that some classes of site may be the most prolific of finds but not in fact represent domestic sites (such as lithic workfloors, cf. Schofield, 1991c:128).

Even though the traditional intuitive assumption that concentrations of finds = occupation sites, is likely to be confirmed through on-site analysis and laboratory study of the finds, we must conclude that there are exceptional cases where this is incorrect. Far more important, though, is the point that past settlement sites and other activity foci take many other surface forms than high-density scatters. To take the 'sites' that might have been found through traditional extensive survey methods as the touchstone of site definition for modern, intensive surveys would be indeed a sad regression of methodology, and we must pay all the more attention to elucidating what the rest of our distributions could reflect in behavioural terms.

OFFSITE MANURING SCATTERS

My own empirical experience would suggest that we need next to try and examine the evidence for extensive manuring in each period, detectable from the widespread carpets of worn potsherds that accompanied more perishable organic rubbish into the cultivated fields. In the Mediterranean the advocates of the 'manuring hypothesis' (Wilkinson, 1982; 1989; 1992; 1994; Barker *et al.*, 1986; Bintliff and Snodgrass, 1988; Hayes, 1991) have argued, at length, on the basis of such evidence, that in certain regions for limited periods there was a highly-significant form of agricultural intensification within cultivable zones using urban and rural settlement refuse. The evidence from France, Italy, Greece and the Middle East has been taken to reflect periodic attempts to sustain high agricultural productivity within unstable 'boom-bust' arable cycles that are linked to overpopulation, market fluctuations and soil fertility decline.

Those who argue against this hypothesis (Wilkinson wittily refers to them as the 'no turd unstoned' school) have seen effective counter-arguments placed against their objections (Wilkinson, to comments in *Current Anthropology*, 1994; Snodgrass, in answer to Alcock *et al.*, in Morris, 1994). Outside of these periods and places there is no *a priori* assumption of widespread manuring activity

Settlement size	Radius of scatter (km)
Hamlets and farmsteads < 1.5 ha	0.2–0.4
Villages 2–9 ha	0.6–1.0
Small town* 10–29 ha	1.3
Large town/city > 40 ha	2.2–6.0

*One example only: site 48 in the North Jazira.

Fig. 20.6: The approximate radius of significant field scatters surrounding archaeological sites in the Middle East (total sample: 19 settlements).

beyond the empirical evidence recorded in most countries of southern Europe, and the knowledge that Greco-Roman agrarian authors recommend such practices.

Such phases of regional intensive manuring are marked in the landscape by extensive potsherd scatters radiating outward from contemporary sites of all sizes. Urban sites can be associated with the most impressive manuring carpets, extending to distances up to half an hour or more from the settlement (as has been documented by our Boeotia Project in Greece for the cities of Thespieae and Hyettos, and in the Middle East by Wilkinson; cf. Fig. 20.6, from Wilkinson, 1989).

An interesting corollary of intensive, sherd-rich manuring derived from domestic rubbish deposits and targeted to arable land, is the complementary concept of extensive, purely organic, manuring in sectors of lowland landscape devoted to pastoral use, where direct animal manuring through the pasturing of flocks would be linked to a virtual absence of domestic, artefact-rich manure characteristic of cropped sectors. Although argued-for in Britain and France (Hayes, 1991: 82) the model remains to be widely-tested in the Mediterranean (but has been tentatively identified in the Middle East, cf. Wilkinson, 1992). A likely complication in recognizing such sherd-poor sectors in heavily-manured landscapes as potential pastoral land, is the evidence for 'the friction of distance' limiting manuring carpets to some 2–3 kms from a typical medium-to-large urban settlement (evidenced with our own Boeotian city 'carpets', and by Wilkinson, 1989). Beyond such distances, the lack of major offsite ceramic carpets could reflect either remoteness from available domestic rubbish supplies or the dominance of pastoral land use.

Identifying arable manuring scatters within the overall spread of pottery across the landscape is as much a qualitative and 'geographic' analysis as a quantitative one; the homogeneity and abraded nature of the sherds, their 'carpet-like' nature on the surface, their disconnectedness from visible horizons of occupation in road sections and other exposures of the subsoil (Wilkinson, 1992), are all helpful clues where overall pot densities are large and areas covered by surface finds are considerable.

When such characteristics are subdued, as might be expected with potential Bronze Age manuring, where

survival factors may reduce manure scatters to the level of vestigial occupation-site scatters (for reasons examined above), then we must accept the likelihood that sample error can create equifinality. Neither the number nor condition of pottery found in primary fieldwalking would distinguish between these two forms of behaviour. Detailed on-site study however could help resolve the interpretative quandary of a small cluster of 1–2 contemporary prehistoric pieces, or more confidently soil pits (but the latter approach has rather prohibitive ethical and bureaucratic drawbacks!).³

If one can reach a provisional working opinion on the local existence of offsite manuring, then the main period(s) concerned should be identified from the chronology of the finds themselves. Recognizing discrete activity foci or settlement sites within these manuring zones begins with the most easily-recognizable examples; residuals of higher density than manuring carpets, but of the same age will be isolatable. Other things being equal, manuring over extensive areas, by definition, should be far lower in quantity than the density at source occupation sites. For example, calculations by Peter Reynolds have shown that whereas in the centre of the Greco-Roman city of Hyettos the density of ploughsoil sherds averages 1.5 million per hectare, in the immediately adjacent plain the town's unbroken manuring carpet averages a 'mere' 10,000 sherds per hectare.

Nonetheless, although a large proportion of activity foci/

settlement sites will emerge with clarity as a result of this predictable differentiation, a not insignificant number of foci will not be picked up through this rule. There is an empirically-tested, and probably not uncommon phenomenon in heavily-manured landscapes: when the occupants of a large site manure a zone extending across and beyond small satellite sites, then the resulting offsite densities could be close to site density in the vicinity of the small sites concerned. It appears likely that small sites of the same age as a major manuring horizon may escape detection during fieldwalking as a result of this scenario; small sites of different periods are more likely to be safely distinguished by chronological distinctions, unless they are very low-density, in which case the 'swamping' of the locality by more numerous offsite finds challenges surveyors to unravel a fragmentary landscape of vestigial character from a small number of pieces of ceramic or lithic.

If one suspects the existence of a potential focus within a manuring carpet, and where the density level of that 'anomaly' is not convincingly elevated above its surroundings, then our own work in Boeotia shows that careful attention to the internal structure of the find scatter and attention to the size and degree of abrasion, plus if one is lucky a more concentrated chronological focus than the offsite material as a whole, can all assist in the correct reading of the locality (Figs. 20.7–8): Fig.

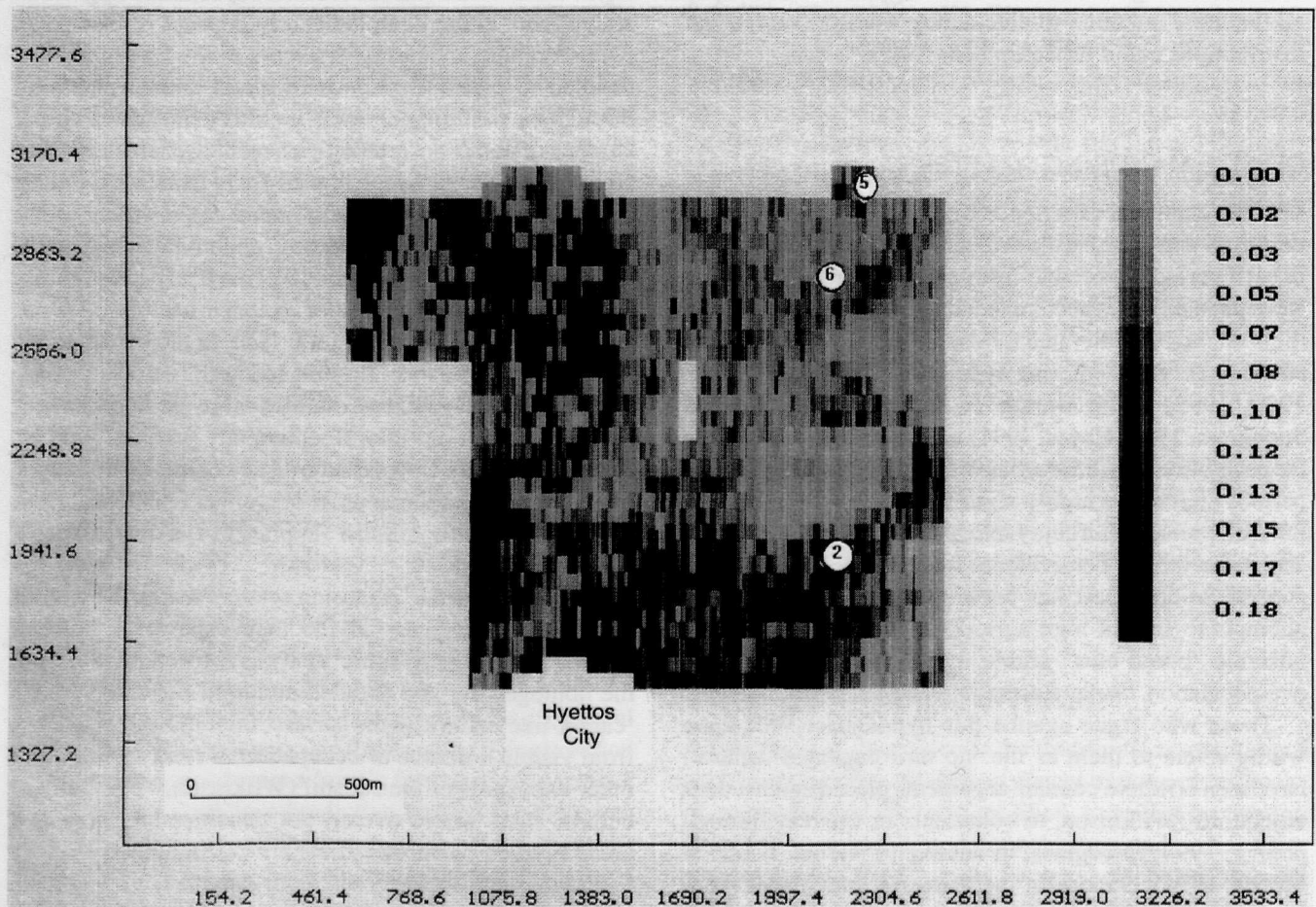


Fig. 20.7: Hyettos survey.

20.7 illustrates the total ceramic density (in sherds per sq.m.) of the landscape north and east of the ancient city of Hyettos. The mosaic is composed of individual fieldwalker transects of 16.7x50 m size. The map is dominated by very large carpets of high density manuring scatters emanating from the city. Only in the lower density outer north-east sector can we see discrete clusters of higher density discard in a very focussed form, two of which mark the location and inner 'halo' of large Roman villa sites (CN5 and 6). In contrast, site CN2 in the outer south-east sector cannot be distinguished from its surroundings in overall density values. Its discovery arose rather from qualitative differences in the freshness of surface material in this locality during primary field-walking. A subsequent secondary intensive collection, visibility-corrected (Fig. 20.8), using a 10x10 m total sampling grid, underlined our suspicions that there was a putative rural farmsite of considerable extent within the heavy manuring scatter, since a clear radiating structure of concentric density became apparent at higher analytical resolution. Final confirmation came with laboratory study of the finds collected from the intensive grid, as there was a clear contrast between the outer grid square ceramic with small-dimension, abraded sherds and the inner grid squares with larger-dimension, less worn sherds.

Another form of carpet-like offsite activity can be created by long eras of lithic-based activity across the landscape (a result of behaviour such as hunting, tool manufacture, tool maintenance). Owing to the problems we are only just beginning to address with lithic recognition in Mediterranean ceramic-based survey, much less has been done on such phenomena in southern Europe. But significantly Clark and Schofield (1991: 103ff) make exactly the same points in connection with surface lithic sites in North-West Europe, that I have just been making in relation to ceramic offsite manuring scatters: 'The (...) problem is that southern England – and particularly the river valleys – are one continuous flint scatter. Although areas of high and low density do emerge, to refer to the high density areas as "sites" may be unrealistic'. In fact lithic sites can be seen to have very varied surface manifestations, some appearing quite 'non-site' like; equivalent densities have been found over large regions, such as the Meon Valley, the Avon Valley. 'Surely we are not going to settle for referring to every field as a "site"?' (1991: 104).

ANALYZING INTERMEDIATE-DENSITY SCATTERS

Having dealt with the traditional 'high-concentration' focus with a broad ceramic assemblage as a likely settlement site, and 'carpet-like' scatters with typical abraded, homogeneous features as manuring evidence, we should be left with a series of further residuals which are less concentrated in density than 'rich surface sites' and usually

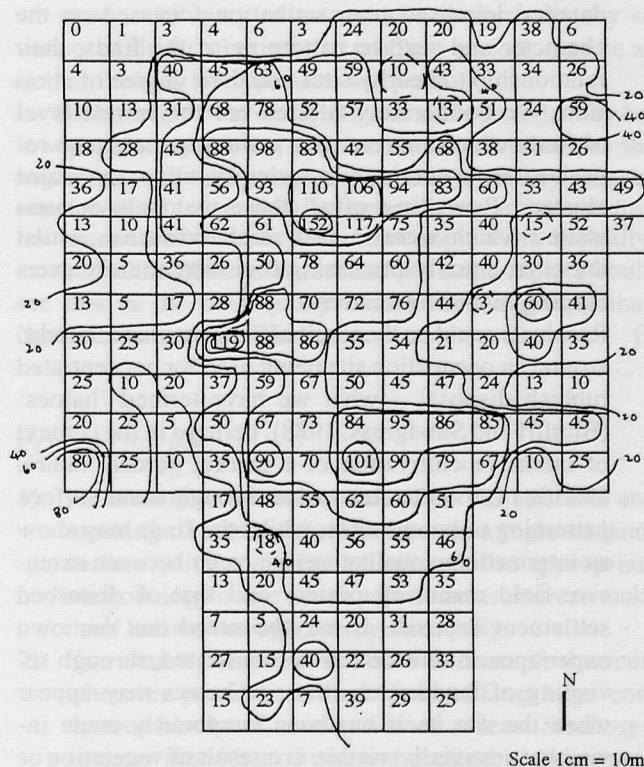


Fig. 20.8: Site CN2, visibility corrected ceramic data.

(but not invariably, see *supra*) more concentrated than extensive manuring evidence.

Those artefact distributions that have not so far been accounted for in our discussion of process and material remains in the landscape are problematic in interpretation. To begin with, as we have seen, vestigial traces can be created under many circumstances and are likely to be common on the surface. Apart from such causes, we may cite severe erosion, artificial transport of earth, casual discard of artefacts during varied activities across the landscape, as some of the likely factors creating additional low-intensity scatters in the ploughsoil. It has to be admitted that many weak foci will escape even close attention in a richly-artefactual landscape, such as many parts of the East Mediterranean. In the West Mediterranean where overall surface artefact densities can be lower, a more subdued site density and manuring density can overlap with these other distributions to create enhanced interpretative problems for field surveyors.

These residuals, generally of intermediate artefact density, which we must now move to explain, could be the result of:

- 1) Overlapping manuring haloes produced by different but adjacent sites, by manuring of different phases, or sectors given preferential heavy manuring due to local variations in land use. Thus on the Hvar (Croatia) Survey (Bintliff and Gaffney, 1988; Gaffney *et al.*, 1991) a whole series of residual medium-

density foci represented such problem-phenomena: detailed localised re-examination focussed on the character and surface patterning of the finds, their relationship to nearby sites and their degree of abrasion. We deliberately filtered out the lowest level of finds which represents a manuring carpet, to reveal a fairly continuous series of minor or major clusters. Revisiting of all these residuals demonstrated which were in fact small farmsites, whilst the other equally-promising foci were merely overlapping manuring scatters.

- 2) Residuals could be the result of the immediate 'infield' around an occupation site being used for concentrated rubbish disposal – what we have termed 'haloes' (Bintliff and Snodgrass, 1988), perhaps in the context of intensive cultivation of a market garden nature. Clarification will often come through trend-surface patterning to known sites, whilst the finds may show an intermediate (qualitative) character between extensive field manuring pottery and that of disturbed settlement deposits. It may be noted that our own experience in Greece has demonstrated, through revisiting of landscapes, that site haloes may appear when the site itself has been temporarily made invisible / vestigially-visible as a result of vegetation or cultivation filters (see above); if it is correct that a considerable number of small sites / sites of limited occupation length remain unrecorded in any one survey season, then this class of phenomenon may be quite common.
- 3) If we have eliminated the above explanations for surface patterning, there is no simple rule to allow us to comprehend what the remaining pottery scatters – normally at intermediate density levels between unusually rich scatters and the average density of manure scatters – might represent. We have argued above that only a multifactorial analysis can assist us further, utilizing:
 - qualitative criteria such as the size and degree of abrasion of material;
 - qualitative criteria of a functional character that may point to cemetery/shrine/domestic human focus/domestic animal focus/specialist worksite/etc. interpretations;
 - indications from mode of cultivation/vegetation cover at the locality; has the density and extent of the surface scatter been affected negatively by such factors, making its appearance vestigial, or are there grounds for evaluating it as realistic? (This last point is more significant for small scatters rather than larger, and can never be definitively resolved except by continual revisits under varying surface conditions. Only through discovering a large number of such scatters can we create the statistical opportunity to control their interpretation).

I do not therefore have confidence that artefact scatters

that are not of the immediately-obvious dense-scatter appearance can be definitively characterized by a single criterion, quantitative or qualitative, least of all by reference to a magic numerical formula. Below the traditional high-density 'site', we find a great variety of important surface manifestations above (and exceptionally even at) the density-level of offsite manuring carpets: small versus large scatters, artefact-poor versus artefact-rich, these varied phenomena are the multicausal products of particular conditions in the season of visiting, variable site function, variable occupation length and variable numbers of people using the location in the past.

Stoddart and Whitehead in central Italy (1991) point out that around Roman town sites it is the densest scatters that stand out above heavy manuring carpets, whereas in more remote areas where manuring is slighter a whole series of less distinctive scatters begins to become apparent across the landscape – scatters that would not be given much significance within a dense urban manuring halo but now demand attention; the moral - we must expect to find and allow for a range of discard behaviours across the landscape. Exactly the same conclusion is stressed by Schofield (1991b: 5), namely that a variety of discard is demonstrable as well as expected from field survey results.

These cautionary remarks ought not to prevent field surveyors from erecting provisional, working-assessments of their artefact scatters. We have argued for as near as possible total surface study leading to the isolation of quantitative and qualitative residuals, which should then be given a secondary intensive study. For a large proportion of residuals this special study may be expected to clarify the likely significance of the scatter, at least within the known limitations of its appearance at the time of discovery. However for the reasons given earlier, in many cases we can expect to misjudge the significance of such scatters, and we must allow for a significant proportion of sites that are temporarily or permanently 'invisible' to surface survey in any one season.

Revisiting can indicate the likely scale of correction for a body of surface sites. Moreover, a very large database of such scatters will hopefully combat the weaknesses of overreliance on the evidence of individual scatters, by providing trends of site types, or approximate frequencies by site type. Here again though, we must be alert to the strong likelihood that certain varieties of site are easier to find or characterize. It goes almost without saying that population calculations are fundamentally affected by the care with which we weigh all these factors of site analysis for demographic purposes.

I am optimistic that recurrent visits to localities will gradually eliminate doubts as to the status of most scatters, whilst a careful programme of selective site examination using geophysical and geochemical techniques as well as highly-detailed surface mapping of artefacts can clarify the nature of 'typical' forms of activity as represented in a survey region (Bintliff, 1992).

THE PROBLEMS OF LOW POPULATION AND LOW CERAMIC UTILIZATION IN THE LANDSCAPE

All the above considerations are eminently-practicable for historic periods of dense human population in a survey region, represented by numerous and varied sites. The special approaches required by surveyors to reconstruct regional activity in later prehistory we have already referred to. I would now like to turn to the problems likely to be encountered in the study of historic eras where population might be hypothesized to have been extremely low and/or ceramic use unusually limited per household. Just as we observed in the case of a comparison between small prehistoric sites and prehistoric manuring scatters, the possibility of sample error is strong, as in such circumstances the potential significance of 1–2 sherds found in a locality is inevitably heightened.

In Mediterranean Europe we do have considerable knowledge of the occupational phases in regional landscapes where such problems are apparent. A first example is the poverty of Late Roman finds in the Ager Tarraconensis survey of Eastern Spain, referred to earlier in this paper. To explain this phenomenon, Keay and Millett (refs. in Note 1) suggest that low density Late Roman evidence in the Ager Tarraconensis was due to few rural sites having access to pottery supplies. This is a problematic interpretation, since the Roman town of Tarragona itself appears to have no such shortage, whilst the distances from potential pottery-sources to the rural sites concerned and local topography involved are also no obvious hindrance. The Late Roman scatters identified, furthermore, seem to be very focussed within the small 'windows' of countryside fieldwalked. An equally, if not perhaps more, plausible explanation could be severe population decline across the countryside leading to smaller, less populated sites and reduced levels of manuring and other offsite activity.

Moving on to a second case-study, let us turn to Italy, where a much-discussed difficult period for regional survey recognition is that of Early Medieval settlement. The approach adopted in Italy, problem-orientation, is essential: seeking out known locations of human activity for the difficult period and comparing the material culture found with written sources to see what the surveyor might expect to find (Barker *et al.*, 1986: 293; for the Rieti survey and medieval site search cf. Coccia and Mattingly, 1992: 253).

However as discussed at length above, this is only the start; it is highly unlikely that a single mode of sherd density or scatter extent will prove definable for an entire region even in a single phase. An appropriate field methodology is required to recognize the true variety in surface sites: line-walking and continuous collection provide a firm database, then there ought to be a strong research focus on the study of the finds from weakly-represented periods, to identify new assemblage components. The careful study of assemblage composition from sites identified through problem-orientation allows us to see the kinds of material

likely to represent contemporary activity elsewhere. But we need to be wary of assuming a uniform density or variety of finds: other sites in problem-periods may be as rich in finds as the type-sites are poor.

The source of our difficulties in such periods may be: low population leaving slight ceramic traces across the landscape, and occupying small and low-density sites; or alternatively, denser populations utilizing and discarding low amounts of ceramic per head of population; or finally, a combination of these two scenarios – some experts would see this as the most likely model for the post-Roman centuries in southern Europe.

CONCLUSIONS

- 1) No assumptions can be made about the structure and meaning of artefact distributions on a regional landscape prior to intensive survey; the appropriate methodology is one which will allow structure to make itself known through survey sensitivity.
 - 2) You cannot sample in the dark: avoid sample shortcuts wherever possible through fieldwalking large contiguous blocks of countryside of at least *Siedlungskammer* size (that of one and preferably more traditional communes / parishes), counting and collecting surface artefacts continuously in frequent and regular transects (fieldwalkers 5–15 m apart, transects no longer than 50–100 m).
 - 3) A logical procedure should be followed in evaluating in the field the complex patterning revealed through intensive fieldwalking. Period-based analysis of the surface distribution of finds should proceed through a series of stages to look for qualitative and quantitative indications of discrete discard behaviours, whose operation can be seen to create particular parts of the regional artefact scatter structure. Typical examples of these behaviours might be extensive manuring; site halo infield manuring/market gardening; occupation sites of varying size and density – reflecting a wide range of variables, both cultural and natural; non-domestic activity foci e.g. cemeteries, shrines, industrial loci, military loci.
- All scatters likely to reflect activity foci should be given a secondary detailed survey using a recording and collecting grid for the counting and sampling of finds (and in some cases complementary mapping of roof-tile, and geophysical and geochemical sampling, cf. Bintliff, 1992) ⁽²⁾.
- 4) The known operation of recurrent distorting factors in the creation of surface sites makes any suggestion of a magic formula allowing easy reading of surface scatters entirely fanciful; sites of the same function and size will give very varied surface densities according to their length of use, history of cultivation, the current state of land utilisation and vegetation cover at time of survey, whilst all cultures create a wide

range of activity foci with highly variable surface manifestations even under identical soil conditions and land use histories.

- 5) Revisiting and careful, intensive examination of all but the largest sites can assist in reducing interpretative distortions, but experience suggests that a notable proportion of surviving sites eludes even the vigilant intensive survey, especially when employing single-visit fieldwalking of a district.
- 6) Field survey is an incomplete guide to regional settlement systems, but it is an illusion to suppose that excavation or historical source control is a firmer basis – these approaches are probably even more inadequate for regional settlement reconstruction than largescale intensive survey. In combination however I believe that these three approaches can create Piggott's 'cumulative credibility'; many of the more intractable problems of settlement and population reconstruction and interpretation may be assisted considerably through a dialectic in the field involving information from all three sources of regional information.

NOTES

- 1 Much effort has been devoted, for example, on the Laconia Survey (Greece) to establishing a mathematical formula for defining the precise edge of 'sites' as opposed to 'non-site' pottery scatter (Cavanagh *et al.*, 1988) without questioning whether discard behaviour involving rubbish disposal might create a more flowing series of transition stages between occupation areas, farmyard zones, gardens, infield and outfield. The central aim of the survey methodology practised on the Ager Tarraconensis Survey (Spain) is the 'discovery' of sites ('ADABS' ie abnormal density above background scatter) through the use of an arbitrary 'magic' formula (any pottery scatter whose density value is within the top eighth or top 10% of all density values for each period qualifies as a likely site) (Carreté *et al.*, 1995; Millett, 1991; Keay and Millett, 1991; the threshold values cited vary confusingly between these publications). The Neothermal Dalmatia Project, using a variant of the Ager Tarraconensis 'magic formula' approach (Chapman and Shiel, 1993), define sites as locations with more than the average density of finds on them.
- 2 On small rural sites sample units of 5x5 or 10x10 m are efficient sizes. On urban sites our experience in Boeotia suggests that 20x20 m sample units are appropriate for towns up to 20–30 ha in size, whilst for larger urban sites of one to several square kilometres, sample units work well at some 50x50 m in size to combine spatial sensitivity with ease and speed of operating the survey.
- 3 I would now accept the argument that manure scatters of bronze age date are unlikely to survive till today in well-cultivated ploughsoil, indicating a likely buried feature as the normal source of bronze age pottery scatters (Bintliff *et al.*, in press).

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