Book Reviews

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Landscape Archaeology as Long-term History: Northern Keos in the Cycladic Islands

J. F. CHERRY, J. L. DAVIS, AND E. MANTZOURANI. *Monumenta Archaeologica* 16. 510 pages, 187 figures, bibliography, index. Los Angeles: Institute of Archaeology, University of California. $50.00 clothbound. ISBN 0-917956-72-9.

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Overachievement is the first impression that one may have in picking up this book. The authors appear to be overdoing it. While the survey itself covers only an area of 20 sq km on Keos, one of the Cycladic Islands, the book runs to 510 pages in length. Is it really possible, one may well ask, to write so much about so little? The answer to this question is, without hesitation, in the affirmative. The project constitutes a serious attempt to document the distribution of archaeological sites on the Keian landscape and to reconstruct past patterns of settlement and land use on the island. *Landscape Archaeology as Long-Term History* makes a valuable contribution to Greek archaeology. But the book does more than this. For those of us with an interest in survey methodology, it offers a clear and detailed account of how the survey was done and of how the interpretation of the patterns found is developed. In short, it gives a good account of the work of survey archaeologists in Greece in the mid 1980s—their aims and aspirations, their methods and working assumptions, their preoccupations and limitations, and the kinds of conclusions that they reach. Accordingly, the book provides an opportunity to review an important stage of growth for surveys in Greece.

In terms of its organization, the book is divided into six main parts. The first one, which is called "Theory and Methods," contains three chapters by the editors: one on the problem orientation of the survey, a second on survey methods, and a third on data evaluation and off-site distributions. The Keian survey, as we shall see below, represents a move toward more rigorous field procedures and more intensive coverage of the land surface, including the recording of off-site finds. The second part, "Background and Data," begins with a chapter that discusses historical and archaeological research done previously on Keos; it also introduces the environmental setting of the survey area (no geological or geomorphological fieldwork was done in conjunction with the survey). The next chapter is a gazetteer of the sites found by the survey; it includes the description of a total of 71 archaeological sites (several of them previously known) as well as another 47 off-site finds where remains of low density were observed on the land surface. The third part deals with "The Prehistoric Period." There is an opening chapter by the editors (with D. W. Wilson) on the ceramic evidence that was used to date the prehistoric sites. This is followed by Torrence's chapter on the artifacts of chipped stone (mainly obsidian). In a separate chapter, Whitelaw presents the work (intra-site surface collections) that he carried out at the Neolithic sites of Kephala (see Coleman 1977 for previous excavations at the site) and Paoura. In a fourth and final chapter, the editors offer their analysis and interpretation of the prehistoric distributions recovered by the survey. Perhaps the most striking thing here is "the very scarcity of prehistoric finds throughout the survey area" [p. 221].

In "Classical Antiquity," the fourth part of the book, there are eight separate chapters which cover a wide range of topics. These include: an introduction to the historical and epigraphical evidence on the island, the pottery for the Geometric through Hellenistic periods (Sutton), the

polis center of Koressos (Whitelaw and Davis), the towers of NW Keos, the extraction of *miltos* (red hematite) on the island (the editors with Rostoker and Dvorak), coinage and federation in the Hellenistic period (Reger and Risser), the epigraphical evidence on land use and settlement in Hellenistic Keos (Osborne), and a concluding overview on the Greek and Roman periods. In the next part, the book moves on, in chronological order, to the "Medieval and Modern Periods." Following an introduction to the archaeology of post-Roman Keos, there is a chapter by Bennet and Voutsaki on travellers' accounts of the island (to 1821). The next chapter by Sutton examines post-revolutionary Keos—the island's population, economy and settlement patterns—from an anthropological perspective. Whitelaw closes this part by giving a report on the main results of his ethnoarchaeological study of rural settlement and land use in the NW part of the island. This is one of the most interesting chapters in the book. Given the steep relief of most of the survey area (only 18% of the land has a slope of 10 degrees or less), Whitelaw described the terracing that is a common feature of the recent landscape (within the area that he examined, 84% of the land preserved evidence of having been terraced at some point in the past). In contrast with the paucity of prehistoric sites recognized in the survey area, Whitelaw is able to document a total of some 1200 structures (farmhouses, field shelters, threshing floors, and so forth) of recent age in the field. This means an average of about 90 such structures for each sq km examined in the ethnoarchaeological study. The book then ends with a sixth part which is called "Retrospect." In a single closing chapter, a synthesis is presented of what has been learned about patterns in the landscape of Keos as a result of the survey. Among other things, the editors reassert (as they stated in the preface some 500 pages earlier) that they do not subscribe to the "tell-everything-you-know" school of history. "Rather, our aim has been to garner as many clues as possible that might help us interpret the archaeological distributions documented by survey" [p. 478].

One of the challenges of writing a monograph on a survey stems from the rapid pace of change witnessed by this comparatively young field of archaeological investigation. Between the time that fieldwork is carried out and a monograph is printed, many years may elapse and the accepted approach to doing a survey may change considerably. In the present case, the survey on Keos was done in the summer of 1983. All of the contributions to the volume were apparently in hand by the spring of 1989, and the book, which, incidentally, won the first Cotsen Prize, came out in 1991. Thus, eight years passed between the work in the field and publication. This cycle, by the way, is about as short as we can expect today. Thus, in writing such a monograph, one has to position the survey carefully in a world in transition. The editors of *Landscape Archaeology as Long-Term History* have done a good job at this. For example, the Messenia survey (McDonald and Rapp 1972) is regarded, in effect, as belonging to the remote past—a golden age of innocence. In looking back on the survey of Melos (Cherry 1982), conducted in 1976 by one of the members of the Keian team, the position taken is a more critical one. In retrospect, the survey could have been more intensive. Perhaps there was too much formalism in the approach to regional sampling on Melos. In short, building on previous experience, there is a chance to make refinements in the survey this time. There is also the prospect of using the settlement patterns found on Melos, another Cycladic Island, for comparative purposes in the Keian survey.

At the same time, in positioning their survey, Cherry, Davis, and Mantzourani want to show that they are aware of recent developments in survey methodology in the broader international sphere. Greek surveys, they feel, have often suffered from a certain provincialism. Accordingly, reference is made in the sections on method and theory to innovative contributions to the literature on surveys (through the mid 1980s) in Italy, Great Britain, and North America. One of the aspirations of the Keian project, then, is to bring survey work in Greece up to speed. Interestingly, during the first half of the 1980s, one of the more innovative surveys, especially for the classical periods, turns out to be a contemporary one in Greece. The Boeotian survey (Bintliff and Snodgrass 1985), by means of trial and revision, has just raised the stakes in the game for those setting out to do a survey in the intensive mode. The Keian survey is ready to follow suit. The commitment is thus made to the recording not just of sites in the more traditional sense but also of the much smaller, low density scatters of material encountered on the landscape. This new approach, the documentation of off-site finds, calls for a corresponding shift in vocabulary: instead of talking about settlement patterns, one now has to discuss the results of the survey in terms of *distributions*. The authors of *Landscape Archaeology as Long-Term History* also look surreptitiously forward at several points in the book to the results of the Nemia survey (with its own further refinements)—a new survey on the mainland to be done by several members of the Keian team in the years after 1983. One of the preoccupations of the Keian survey, as a whole, is with how to derive or forge an interpretation from a distribution. To quote the authors: "In Greece at least, explanations for observed patterns in the data are all too often asserted, without any sustained attempt to spec-

ify the logic intervening between a surface archaeological distribution and its interpretation" [p. 478]. While due emphasis is placed, as we have seen, on improvements in field procedures (at one point in the book, the editors even note that this has been an obsession of survey archaeologists in Greece in recent years), the act of interpretation is taken to be an even deeper problem. To quote from the authors again: "In short, while we applaud the fact that the character of the surface archaeological record can today be described more accurately than a decade ago, it is time to devote more attention to explanation" [p. 327]. The working assumption here is that, with the recent improvements in field procedure, one now has good control over the recovery of distributions on the landscape. But is this really so?

In order to consider this question more closely, it is useful to introduce some further information on the background of the Keian survey. To begin with, the chance to do the survey came about on short notice. In other words, plans for the survey had to be made in a hurry at the last minute. The survey permit limited the work to only the NW corner of Keos (approximately one-sixth of the area of the island). Given the small area to be covered, the fieldwork was to be conducted in a single year. There was no possibility of implementing a multi-year research design (something that the authors openly admit would have been more favorable for the project). The decision was made to do an all-period survey in the tradition of much previous work in the Mediterranean. All of the survey area that was available was to be covered, and the approach to the survey, as mentioned above, an intensive one. Taking advantage of the widespread use of terracing and the definition of field boundaries with stone walls on Keos, it was decided to have such field units serve for purposes of sampling and recording. In all, the survey area was divided into 874 field units or tracts. When a given tract was surveyed, an assessment was made of the conditions of visibility on the land surface. This was done on a scale from 1 to 10: 10% as the value for the lowest relative ground visibility and 100% for the highest. Without going into the details of how this was done (the assessment of visibility could have been operationalized in a more effective way), the results of this work are of considerable interest [Fig. 3.6]. This bar graph shows that, for the lowest three classes (10% through 30% of relative ground visibility), the percentage of fields belonging to a given class is higher than the corresponding percentage of sites. The opposite is the case for the next four classes (40% through 70%): the percentage of sites is always higher than the percentage of fields. The last three classes (80% to 100%) have much lower numbers of both fields and sites than the previous seven classes but the percentage of sites is in each case equal to or greater than the percentage of fields. In their own statistical analysis of these two distributions, based on a nonparametric Kolmogorov-Smirnov two-sample test, the authors find that there is a significant difference between them. "There is, in other words, a tendency for the artifact concentrations we have treated as sites to lie in tracts whose visibility is distinctly better than average" [p. 42]. Thus, it comes as a real surprise when they reach the following conclusion in the next paragraph. "Again, we can conclude that field effects have introduced some distortion, but that it is not overwhelming" [p. 45]. There seems to be a contradiction here. Part of the problem stems from the bar graph itself, whose meaning may not be readily apparent to those without a quantitative background. Fig. 3.6 does not display the relationship between visibility and site recovery in a clear and concise way. Taking what is presented in Fig. 3.6 at face value, we can reanalyze the data and come up with a graph which shows the effects of visibility in a more revealing way. In this case, the ratio of sites to fields is calculated for each visibility class and then the ratios (on the y axis) are plotted against the respective classes of visibility (on the x axis; this is done for only the first seven classes since the numbers of both sites and fields are small for the last three classes, as mentioned above). What a revised graph shows is a strong positive correlation between visibility and the recovery of sites. To put the relationship in plain words, it means that when visibility is at the 70% level, one will have to look at six field units, on average, in order to find one site. In contrast, when visibility is 30% or less, there will be a need, again on average, to examine 20 or more tracts in order to recover one site. The effects of visibility are clearly more serious than the authors realize.

Before discussing some of the implications of the problem of visibility for the survey on Keos, let me say a few words, by way of background, about the development of my own interest in the question. This was one of the new issues that I raised in the closing section of a review article on surveys that I wrote a decade ago (Ammerman 1981). In the mid 1970s, as part of the survey of the Acconia area in southern Italy, we had undertaken the repeated, intensive coverage of the same landscape over a series of years. What was observed on the land surface often changed from one year to the next; visibility was not some sort of timeless constant for surveys. We reported the results of the Acconia survey through 1976 in a monograph (Ammerman 1985a). In fact, in the years from 1977 through 1980, we continued to repeat the coverage at Acconia and this work led to the progressive recovery of

even more prehistoric sites in the area. It was found that one of the factors influencing the visibility of sites on the land surface was modern land use itself. In 1988, I was invited to help in the design of a survey in the region of Tuscany in central Italy. As part of the Rosignano survey, we tried to do a better job of quantifying the effects of visibility on the results obtained from the survey. A report on this study, carried out between 1988 and 1992, is in preparation (Terrenato and Ammerman). In working on the historical section of this report, a search was made of the literature for previous quantitative treatments of visibility. The account in the third chapter of the book under review, to the credit of the authors, was one of the few cases that we encountered. By the way, the reanalysis of the Keian data was done several months before I was asked to write this review; the editors of the journal did not know about the work in progress on site visibility in Tuscany. The design of the Rosignano survey, which is oriented toward the recovery of sites dating to the classical periods (Etruscan and Roman), was facilitated by the availability of recent geographical and cadastral maps, both at a scale of 1:5000. The recording of visibility was done on a field-by-field basis using the cadastral maps and a two-way classification of the land surface (by geomorphology and ground cover). The analysis of the Rosignano data, based on a sample of 25 units (each measuring 1 km on a side), reveals clearly the effects of visibility on the recovery of sites in the survey. This finding does not mean that survey archaeologists have to throw up their hands in despair. They simply have to become more realistic about the complex endeavor in which they are engaged. In the report on the Rosignano survey in preparation, we want to indicate some of the ways to cope with the problem of visibility in the interpretation of the results of a survey.

What are some of the implications of this problem for the book under review? To begin with, the claim that the effects of visibility are "not overwhelming" is unjustified. The working assumption that the archaeological distributions on the landscape are well known is unsound. It is not simply time to put all of one's eggs in the basket of interpretation. The best way to view the book, as it stands, is as a heuristic exercise in analysis and interpretation. As can be seen in Fig. 3.6, more than half of the tracts in the Keian survey have a relative ground visibility of 30% or less (the first three classes), where the rate of site recovery is low. One therefore has a limited or incomplete knowledge of the sites in such tracts. This is especially true for sites of small size and for off-site finds. The Keian survey is faced with the dilemma of wanting to recover and record smaller scatters of surface material and yet not recognizing the limitations that low visibility can place on this aspiration. Incidentally, it is worth noting that Whitelaw takes a more realistic stance in his intra-site study of surface material at Kephala. He accepts that visibility is a problem; the treatment that he adopts (not without its own risks) is to correct the counts of the material in a given collection unit by multiplying by the reciprocal of the value for visibility of that unit (that is, if visibility is 100%, the counts are left as they stand; if visibility is 50%, the counts for the unit are doubled; and so forth). Thus, there is tension within *Landscape Archaeology as Long-Term History* itself over the issue of visibility. At the same time, for the Keian survey, all is not for naught. In the case of those tracts with higher levels of visibility (perhaps one-third of all the field units), one probably has a much better knowledge of the occurrence of sites and off-site finds. In short, the recovery of sites (and one's knowledge of patterns or distributions, in turn) is not of uniform or homogeneous quality over all of the tracts of the survey. The suggestion, then, is that the authors should consider redoing the analysis of their survey data—an analysis that will take more account of the heterogeneity among tracts with regard to visibility and site recovery. This is admittedly no easy undertaking. But it may well lead to quite different and more qualified interpretations of past patterns of habitation and land use on Keos.

Some further comment on the nature of off-site archaeology is perhaps called for here. In the Keian survey, there is some sense of frustration in that what is actually learned from the study of off-site finds does not live up to expectations. For example, the authors find it difficult in some cases to date what is found off-site. In other cases, there is uncertainty over whether or not the artifacts observed at a given spot on the landscape all date to the same period (due to the lack of a specific age for each artifact encountered). But there is an even deeper issue with regard to off-site finds that needs to be discussed—one that does not seem to be well understood in the survey literature. It has to do with the following paradox: as coverage in surveys is made more intensive and scatters of smaller and smaller size (or lower and lower density), down to the individual artifact, are recognized, that which is actually observed on the land surface tends to become more stochastic in character. The impulse in recent years towards surveys that are more intensive has been a positive development. In conceptual terms, however, off-site archaeology comprises a much more complicated business than is commonly realized. The reason for this resides in the far-from-straightforward relationship between the archaeological remains that happen to appear on the land surface and those that occur in the ground.

Briefly, to illustrate this point, let us consider the common case where the land has been cultivated or worked at one or more times since the original discard of the artifacts. A given artifact will occur at any one time in one of three places: (1) on the surface, (2) in the plow-zone or (3) below the plow-zone. As each new episode of plowing (or working) takes place, one can imagine a circulation of artifacts, according to what amounts to a Monte Carlo process, such that the few pieces that were formerly on the surface are now in the plow-zone, while other pieces starting in the plow-zone are now brought to the surface. As known from experimental studies (e.g., Ammerman 1985b; Odell and Cowan 1987; this varies to some extent with local conditions), the ratio of the material on the surface to that in the plow-zone is on the order of 1 in 20. For example, if there are 100 pieces in the plow-zone, this means that one can expect on average 5 pieces to appear on the surface. At any one time, however, the count on the surface will usually not take the average expected value. Instead, with each new episode of cultivation, it will vary in a stochastic manner around this central tendency (most likely taking different values somewhere in the range from 2 to 9 pieces in the present example). This is just the sort of variation from one time to the next that is seen in replicated surface collections (Ammerman and Feldman 1978) and plow-zone experiments (Ammerman 1985b). Let us further assume, again for the sake of illustration, that only 10 out of the 100 artifacts in the plow-zone have attributes that are diagnostic enough to be datable. Given the same surface to plow-zone ratio used above, this will mean that there is a good chance at any one time that none of the datable artifacts will make an appearance on the surface. This may help to explain the dating problem with regard to off-site finds encountered in the Keian survey. In the example that we are considering, note that all of this is happening under the assumption of good visibility. The situation will only be worse if the conditions of visibility are less favorable. Thus, the burden of trying to work with low density surface material is that of its inherent stochasticity. Incidentally, it is unfortunate that Odell and Cowan (1987), in the analysis of the data from their tillage experiments, adopted an inappropriate quantitative treatment, which masked the effects of stochasticity (Yorston 1990). Finally, let us not forget to mention an alternative case—one with even more negative implications for a survey—which may be more relevant to those parts of Keos with a steep and rugged relief. This is the case where soils are very thin or where erosion may even lead in places to exposure of the bedrock on the surface. There are two problems that arise here: one has to do with the obliteration of the archaeological record over the long term (especially the loss of ceramics) and the other with the lateral displacement of artifacts under such conditions (in particular, movement down-slope).

If the history of archaeological surveys over the last three decades has one thing to tell us, it is that survey archaeologists have usually been too optimistic. They have also been too impatient. The Keian survey documents these two traits in the context of surveys in Greece in the mid-1980s. My own view, as I have tried to suggest in this review, is that it is really not productive to try to sweep a fundamental problem under the rug by saying, for example, that it is "not overwhelming." What we need are more surveys in which the time is taken to plumb the depths of basic methodological issues such as visibility. The survey is here to stay in archaeology. It no longer has to be defended in a partisan way. Its practitioners would be wise to slow down—to become more patient and more self-critical in their work. In addition, they should try to remember that a survey operates, not in some timeless framework, but is conducted within the stream of history itself. As I have said before (Ammerman 1981), time's arrow conditions in part what the survey archaeologist will happen to see on the landscape in any one year. It is fine indeed to want to study the long-term history of a region or a landscape by doing a survey. But we should not let ourselves forget that the means to this end must pass through the complex vicissitudes of the short-term history of our own time.

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The Aerial Atlas of Ancient Crete

J. WILSON MYERS, ELEANOR EMLEN MYERS, AND GERALD CADOGAN, with one chapter on geomorphology by John A. Gifford, one on climate and flora by Edward Flaccus, and site descriptions by 34 leading scholars. 337 pages, 189 color plates, 5 black and white plates, 45 plans, 9 maps, 44 site bibliographies, glossary, and index. Los Angeles, CA: University of California Press, 1992. $110.00 clothbound. ISBN 0-520-07382-7.

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When Daidalos, the first airborne Cretan, was instructing his son in the art of flight, he advised him to stick to low-level performances. Ikaros ignored his father's words, with consequences that are well known, but the Myers have taken the hint to heart. The result is a superb collection of detailed, high-resolution color photographs of Cretan archaeological sites, taken during the 1980s from a custom-built, 34-foot blimp balloon tethered at low altitudes. These photographs form a remarkable archive of aerial images of the island's antiquities, and will certainly remain an important source of information for many years to come. A large, finely produced and thoroughly beautiful volume, this is certainly not a book to take into the field, but in encouraging us to look closely and carefully at the sites themselves it may serve to bring some of the freshness of field observations back into the library. For specialists and new students alike, *The Aerial Atlas of Ancient Crete* is a useful and stimulating publication.

The photographs that form the core of this atlas document 44 sites, and represent a broad spectrum of periods and places. About three-quarters are predominantly, if not entirely, Bronze Age (i.e., Minoan) in date, but a considerable effort has also been made to cover the island's Iron Age to Classical *poleis* and Roman centers, although the remains of Byzantine, Venetian, and Ottoman Crete are, sadly, not included. The variety of functional types of site is impressive. Minoan examples comprise not only palaces, towns, villages, and so-called "villas," but also the unique mountain shrine at Kato Syme and a wide range of cemetery architecture, from the early tholoi and "house" tombs, via the multi-period necropolis of Archanes-Phourni, to a spectacular view of the Late Minoan III chamber tombs at Armenoi. The only major omission is the peak sanctuary (save, serendipitously, in the case of Karphi). Juktas, the largest of these, was declared out of bounds to the team, but an aerial view of Petsopha or Traostalos might still have illustrated ritual foci, temenoi, and approaches. Within the Minoan group as a whole, the prominence given to the new generation of sites that is doing much to alter our perspective on Minoan civilization is encouraging. Kato Syme and Archanes-Phourni have already been mentioned; others include the temple at Archanes-Animospilia, the enormous building at Archanes-Tourkoyeitonia, the port town at Kommos and (a veritable "Stop Press" for the 1980s) the recently-uncovered protopalatial structure at Ayia Photia. For many people, these photographs will be their first clear images of some crucial new pieces of evidence.

Even within the limits of the Minoan to Roman periods, the selected sites are, of course, a modest sample of Crete's archaeological wealth, and it is interesting to reflect how closely the selection of these aerial images has been determined by factors essentially beyond the compilers' control. Air traffic regulations and other safety issues required the exclusion of sites as major as Amnisos, Aptera, Chania, and Juktas, and some of the most carefully preserved sites, such as Nirou Hani and Mallia Quartier Mu, could not be photographed thoroughly because of their protecting roof. Neolithic sites never appear because they are either obscured by later components, located in caves, or too unphotogenic many years after excavation. Yet the strong bias in favor of Bronze Age sites is surely also a testimony to the pro-Minoan bias still rife among archaeologists working in Crete. Minoan sites typically appear with large areas exposed and maintained. Later sites are all too often lost in a *maquis* jungle, from which emerge a handful of overgrown structures (looking for all the world like the lowland Maya centers a century ago). Dreros, with its temple roofed over, its agora smothered in vegetation, and its outlying area a mass of tumbled stones and bushes, illustrates the problem. Inevitably, the *Aerial Atlas* tells us quite as much about the priorities of modern archaeologists as about the monuments of ancient Crete.

The photographs themselves are almost uniformly excellent. Most were taken from directly overhead in raking light, and are intended to produce a photo-plan or map of the subject. A site and its immediate surroundings are