

## 5. Solving the Puzzle of the Archaeological Labyrinth: Time Perspectivism in Mediterranean Surface Archaeology

*LuAnn Wandsnider*

### PROLOGUE

Everyone knows the story of Icarus. His father Daedalus was the clever fellow who helped Pasiphae, wife of King Minos of Crete, in her assignations with the bull. She gave birth to the Minotaur and, for his part in this indelicate act, Daedalus was put to work by King Minos to fashion the Labyrinth on Crete in which the Minotaur (and his mother) might be confined. King Minos also imprisoned Daedalus, who did not suffer confinement lightly: he crafted wings, like those of a bird, so that he and his children could make their escape. Icarus was warned, and warned again, by his father about the dangers of flying too near the sun. Nevertheless, Icarus swooped into the heavens, shouting back his joy in flying and the wonders he beheld from his perch on high. Of course, soon the wax binding the feathers to the frame began to melt, the feathers came free, and Icarus himself plunged into the sea, much to his father's anguish. Daedalus was successful in escaping King Minos' Labyrinth.

Little known, however, is the story of Icarus' sister. Although her father also fashioned a pair of wings for her, Icarus' sister refused to wear them and pleaded with her father and brother to stay longer and try another means. She feared for both their lives. Alas, they left her, and we know what became of them. As for her, she studied hard other avenues of escape: how olive leaves floated on the sea breezes, how spiders rode silk filaments, how hawks with fixed wings soared on thermal currents. From these initial studies, Icarus' sister began a methodical study of aerodynamics, first inventing calculus and using it to explore aspects of lift and drag. By this time, she had determined that her intuition about bird-like wings and a flapping propulsion was correct; wings would not support her and again she mourned her lost father and brother. She eventually settled that a kite would be her vehicle, but what kind of envelope would support her weight? How would she control it? She considered in turn diverse fabrics and their properties. But, to understand the stresses and strains they would have to bear, she found she needed vector algebra and it took her a couple of years to master

this. She experimented with parchment and flax and also the webbing produced by spiders. This latter seemed to serve best, but it took some time to establish spider ranches (those early days of spider study were challenging indeed) throughout Crete to grow enough silk with which to weave her kite. Weeks of trial flights now followed. Of course, by this time, Icarus' sister was rather advanced in years. Consulting a local oracle, finally, a departure day was set. One fine June dawn, with a silver kite arching above her and invoking the fortitude of Artemis, Icarus' sister launched herself over the sea, dipping low and then catching an updraft. Her fate? Did she successfully escape the Labyrinth? Unknown. King Minos' archers last saw her sailing low over Crete before heading towards the mainland.

I use the strained metaphor of Icarus and his sister to characterize the state of archaeological landscape studies in the Mediterranean (and elsewhere). The Labyrinth of the archaeological record, fashioned not by Daedalus but by human activities and that of other species and geological processes over the millennia, is our puzzle, perhaps not to be escaped, but to be solved. With ever greater technical sophistication, Mediterranean (and other) archaeologists have crafted finer wings with which to document and interpret past landscapes in terms of sites and settlements, settlement patterns and settlement systems. A better binding agent has been sought, reinforced feathers developed, and Icarus has been put on steroids so that he might beat his wings with greater strength. Yet, the vehicle of 'settlements' – the propulsion system, as it were, predominating in Mediterranean (indeed, worldwide) landscape archaeology – is flawed, fatally so. Such studies may from time to time correctly represent the past (Daedalus, after all, was able to make shore even with analog bird-wings), but this may be more the result of chance than design. Icarus' fate is more typical of settlement pattern studies in general: both their authors and their audience think they are flying, for they report credible results which seem to satisfy how we think the past should be understood. But the sun is beginning to melt the wax,

Icarus can't beat his arms fast enough, and he is losing altitude: the full potential of archaeological landscapes will not be realized through settlement studies, no matter how well executed.

As for his unnamed sister, who fashioned a propulsion system based on knowledge gained from a hard-won understanding of available materials and how they might work, her fate is at present unknown. The value of these other means by which to negotiate the Labyrinth – to approach the archaeological landscape, that is – emanating from a growing understanding of archeological deposits, how they form and how they can be interpreted in a way that does not abuse or deny their formation history, remains to be seen.

## INTRODUCTION

This volume is devoted to furthering the exchange of information among and between the many high-quality, pedestrian archaeological surveys being conducted in the Mediterranean Basin. Comparing and contrasting these rich records of human endeavor promises to yield critical regional-scale insights, building on and complementing those from earlier syntheses in the Mediterranean (Alcock 1994) and the Near East (Wilkinson 2000), and correcting 'Mediterranean myopia' (Blanton 2001).

To a greater or lesser extent, such an enterprise requires that insight-sharing researchers also share a common paradigm (Kuhn 1970), including an understanding of how archaeological surface deposits form, what information they may yield, relevant *chronotypes*, *i.e.*, models of causation, agent, and temporality (following Bender and Wellbery 1991; *contra* Gregory, forthcoming), methods, and empirical and conceptual units (*sensu* Ramenofsky and Steffen 1998). While agreement on all aspects of the interpretative enterprise that is archaeology is not expected, some common ground is necessary. In what follows, I will point to a condition of multiple paradigm disorder, with elements of at least two paradigms guiding research: a regional studies paradigm seated in a functional, processual metaphysic, and a multi-temporal paradigm seated in a formational metaphysic. Such a condition suggests we are still somewhat far from that common ground. Nevertheless, confusion of this sort is to be expected during a paradigm shift and can be interpreted as a sign of disciplinary vitality.

I begin by reviewing the several paradigms within which the archaeological landscape has been approached in the Mediterranean. Beginning in the 1950s, the text-inspired historicist approach, emphasizing monuments, was supplanted by a regional studies or settlement archaeology approach. Other recent approaches I characterize as employing a multi-temporal chronotype, such as that from archaeological *Annaliste* adaptations (Barker 1995; Bintliff 1991a; Knapp 1992), Bailey's (1981; 1983; 1987) time perspectivism, or McGlade's (1995; 1999a; 1999b) eco-dynamics. Recently, such approaches have been ex-

PLICITLY tied to a formationally nuanced understanding of archaeological deposits (Knapp 1992; Murray 1999; Smith 1992). Mediterranean practice has long reflected a keen appreciation for the formationally complex surface record. Moreover, to a limited extent, researchers often rely on chronotypes or models of causation, agent, and temporality that are also complex. Curiously (and evidencing multiple paradigm disorder), however, the parlance of Mediterranean survey is based, superficially at least, in the regional studies paradigm – *i.e.*, in discussion of sites and settlements and other functional entities.

In part, this situation is due to conceptual and methodological impoverishment. Conceptual tools for interpreting the taphonomically or formationally complex landscape in terms of a variety of short-, medium-, and long-term processes are still under construction. I attempt to address this impoverishment, specifically referring to current work in southern Turkey and concluding with a more general discussion of methodological issues.

## MEDITERRANEAN ARCHAEOLOGICAL LANDSCAPE PARADIGMS

Kardulias (1994) and others (Bennet and Galaty 1997; Dyson 1982; Morris 1994) nicely review the paradigm shift that occurred in Mediterranean prehistory and Classical archaeology, as text-inspired archaeological research gave way to anthropologically-oriented work in the 1950s to 1970s. Earlier archaeological work focused on specific sites mentioned in historical texts, seeing such monuments as material testimony of Hellenism, the spirit of which infuses Western thought. Past change, when it occurred, did so because of invading armies, migrating populations, and diffusing ideas (Jacobsen 2000; Snodgrass 1985). That is, the chronotype of culture history or historicism, seen also in European Paleolithic (Clark 1994) and Iron Age (Olivier 1999) analyses, also organized Mediterranean studies. The methods employed came from art history, emphasizing detailed description of the unique (Kardulias 1994; Renfrew 1980). Empirical and conceptual units were of the classically informed common-sense world.

### *Regional Studies and Settlement Archaeology*

The shift to a regional studies paradigm in the Mediterranean, grounded by a functional metaphysic, seems to have been shaped by developments both internal and external to the discipline (Athanasopoulos and Wandsnider, forthcoming). Fotiadis (1995: 99–100) notes the general move of the social sciences towards scientific humanism, wherein 'universal man,' endowed with 'adaptive flexibility,' was taken as the natural-technical object of research. This functional metaphysic is evident in various British geographical approaches to archaeology and the environment, to be seen in the work of O. G. S. Crawford, Grahame Clark, and their heirs (Daniel 1975;

Jacobsen 2000; Trigger 1989). It is also evident in the cultural ecology of Americanist archaeology, which guided Gordon Willey's (1953) initial efforts in settlement pattern archaeology in the Virú Valley of Peru and Robert Braidwood's (1937) work at Antioch; and it reached an apogee of sorts in the processual archaeology of David Clarke and Lewis Binford (Trigger 1989). In the Mediterranean, the Minnesota Messenia Expedition (McDonald and Rapp 1972) set the standard for regional, multi-disciplinary work focused on 'man and his environment.' Reflecting internal developments, Renfrew's (1972) study of the emergence of complex society in the Cyclades marks the first explicitly anthropological treatment of a subject in the classical world. These two benchmark studies inspired three decades of high-quality survey in the Mediterranean basin, culminating, for instance, in the sort of studies presented in the series *The Archaeology of Mediterranean Landscapes* (Barker and Mattingly 1999; 2000).

The orienting chronotype (or model of causation, agent, and temporality) of the regional studies paradigm was explicitly anti-historicist and processual (Kardulias 1994); causation was seen as complex and as due to demographic, internal social, economic, and political dynamics. Each of these different forces operated to create the organization seen at each spatial scale in a hierarchy of settlement (household, community, region) (Ammerman 1981; Gowlett 1997; Parsons 1972; Trigger 1967). For a given time period, settlement patterns, thus, represent a snapshot of demographic trends and the social, economic, political, and religious institutions that govern daily life. As such, regional settlement pattern studies epitomize a structural-functional approach closely approximating that in Durkheimian social anthropology (Trigger 1989: 284–85).

Within this paradigm, empirical units include ceramic types (carriers of chronological information) and regions. Sites are recognized as problematic empirical entities that require interpretation to be distinguished (Cherry *et al.* 1991). They are conventionally defined as 'anomalously dense concentrations of artifacts [and features; (Kardulias *et al.* 1995: 9)] with definable spatial limits' (Cherry and colleagues, in Wright *et al.* 1990: 606), 'which provide an opportunity to discuss functional interrelationships between data elements' (Given *et al.* 1999: 24). That is, they are empirical entities owed to ethnographically referable human endeavors, but seriously affected by other (less interesting) processes through time.

Conceptual units, on the other hand, include settlements and settlement patterns. Settlements, occupied by communities and perhaps materially represented by sites, are also problematic in their definition. Gordon Willey (1968: 216) clearly conceived of this definition as an important issue with two parts: (1) creating sites as analytic units derived from observed structures and features; and (2) demonstrating that a site was indeed the material reflection of a community, *i.e.*, a settlement. In the end, he could specify no objective criteria for doing either and so recognized settlements as preliminary designations. Given

*et al.* (1999: 24), concerned more with recognizing domestic space as opposed to community space, stipulate:

We define a settlement as any site that has material culture remains in close association with architectural features spread over a hectare or more, including several distinct structures. Wherever a dense scatter of sherds is accompanied by an equally dense spread of roofing tiles and rubble that could indicate architectural remains of the same date as the sherds, we tentatively regard this combination of features as a settlement...

That they recognize the same interpretive problem as had Willey is suggested by their use of the word 'tentatively.'

Settlement patterns are 'a set of culturally significant locations, each of which occupies a specified position within an array that makes up a coherent distribution' (Fish 1999: 203). Importantly, settlement patterns are the essential conceptual device that 'enables archaeologists to efficiently relate large bodies of data to complicated assumptions in a widely comprehensible manner' (*ibid.*). Using versions of settlement pattern analyses, demographic and structural issues have been addressed throughout the Mediterranean (*e.g.* Bintliff and Sbonias 1999), although at a more local scale than that reported for other parts of the world (Blanton 2001).

Methodologically, Mediterranean regional studies of the 1970s and 1980s were coherently interdisciplinary and focused on the region as a fundamental unit of interaction. Systematic survey, complemented by geoarchaeological and geophysical studies, was and is the primary means for locating temporally sensitive artifacts and sites (Kardulias 1994). It was recognized early on as particularly effective in the Mediterranean, with its excellent surface exposure promoted by a long history of grazing and plowing and also by erosion (Dyson 1982).

Settlement pattern studies, undergirded by functional, processual principles, have come to be one of the dominant interpretive vehicles employed in archaeology today (Fish 1999: 207, table 14.1; *cf.* also Alcock and Cherry, Ch. 1, this volume, Figure 1.4): 20% of the recent articles appearing in *American Antiquity* and *Latin American Antiquity* rely upon settlements and settlement patterns to interpret past cultural dynamics, as do most of the contributors to the series *The Archaeology of Mediterranean Landscapes* (Barker and Mattingly 1999; 2000). As Fish (1999: 203) notes, most archaeologists 'have internalized the concept [of settlement patterns] to the point that there are few reflections on its impact...' and that the concept of settlement patterns is 'so fundamental to reconstructing past lifeways... that after its influential articulation by Willey, and exemplary implementation in the Virú Valley, it became a basic tenet of subsequent method and theory....' But challenges to the efficacy of the regional studies paradigm and to the interpretive convention of settlement patterns were voiced even as early as the 1970s and continue to be voiced today.

The chronotype (model of causation, agent, and temporality) of the regional studies paradigm has been challenged as non-comprehensive and unsound. Echoing a general critique of processual studies, Bintliff (1991b) notes that the structural-functional chronotype appears to work well for describing and generalizing about regional communities and societies, but not about individuals; it emphasizes major trends, de-emphasizing short-term events; and, finally, the associated positivistic approach is recognized as flawed. Specifically focusing on approaches to the archaeological landscape, Tilley (1994: 11) argues for the abandonment of a false objective consideration of 'geometrical universal space,' reflected in a concern for site catchments and regional economic models and the embrace of an approach that considers the construction of human places in space through on-going human experience and action in the world. The contributors to Ashmore and Knapp (1999) explore these constitutive acts further, considering landscapes as memory, identity, social order and transformation (see also Anschuetz *et al.* 2001).

In the methodological realm, other disjunctures have been recognized. In a seminal paper, Cherry acknowledged various 'truths' about the surface archaeological record and recognized operational problems at both the site and regional spatial scales:

- (a) The necessarily coarse chronological framework, seldom more precise than a century and often much vaguer than that, which results from the use of aggregate collections of poorly preserved surface material, so that
- (b) Maps of site distributions based on survey data to some degree (often unknown) must be taken to represent 'palimpsests' of sites, not all of which were necessarily in use simultaneously (cf. Hamond 1978).
- (c) The smearing and blending of surface finds, by natural or human agencies, means that small sites may often go unrecognized and sites of all sizes and types may be difficult to define accurately in spatial terms.
- (d) Information about the internal organization and function of sites is usually very difficult to obtain. (Cherry 1983: 379).

Moreover, the surface archaeological record 'is likely to consist of a *virtually continuous spatial distribution of material over the landscape*, but a distribution extremely variable in density' (Cherry 1983: 395, emphasis in original; see also Dunnell and Dancey 1983: 272). The character of this distribution is owed to a number of factors, including human activities, by which artifacts and features are created and deposited; these include organized long-term behavior that results in some places on the landscape accumulating more artifacts more than others (Binford 1981a; Foley 1981; Cherry *et al.* 1991: 48); and subsequent human or natural activities which move or concentrate artifacts (Alcock *et al.* 1994; Cherry *et al.* 1991; Given *et*

*al.* 1999). Furthermore, the surface record is dynamic, even on an annual time scale: archaeological materials may appear and disappear as a result of surface geomorphological processes (Ammerman 1981; Dunnell 1988; 1992; Taylor 2000).

Related temporal issues have also surfaced. Plog (1974) labeled Cherry's (1983: 379) point b (above) the 'synchronic assumption.' (See also the 'contemporaneity problem' [Dewar 1991; Schacht 1984; and Wright, Ch. 9, this volume].) In addition, he noted that because of 'periodization' (Cherry's point a, above), change, when detected by archaeologists, would appear to be sudden and transformative, rather than gradual and evolutionary. Chapman (1999: 66, 69) adds two other distinctions. Noting our dependence on surface ceramics for dating, the 'tyranny of pot typology' assumes that when – archaeologically – we see a change in ceramics, then this indeed registers a change in behavior, and that moreover ceramics are a good indicator of change in general. This tyranny generates a concern for temporal boundaries, wherein archaeologists feel compelled to impose an order on what may be chaos. Second, when we find a larger-than-average number of sherds in a surface scatter, is this concentration the result of more intensive deposition, of higher site population (which has implications for interpretations of nucleation and dispersion in the Mediterranean), or of longer occupation (see also Sbonias 1999)?

At the site level, operational or measurement problems included the consistent and reliable definition of sites in the field, and their functional and temporal attribution. In an extended discussion, participants in a colloquium on archaeological survey in the Mediterranean area, held in the early 1980s, could not agree on an operational definition for site (Keller and Rupp 1983). Various non-site methods and *post hoc* assessments (Cherry *et al.* 1991; Gallant 1986) have brought internal consistency to the definition of sites. But revisiting this issue in 1994, Cherry (1994) called attention to the persistent problem of functional assignment. Finally, regarding settlement patterns, Hope Simpson (1983; 1984), echoing Taylor (1972), noted the difficulty of recovering an entire settlement pattern, because of differential burial and erosion and the obfuscation of the surface by building and vegetation (though see Terrenato, Ch. 4, this volume).

Bintliff (1999a: 21) has recognized much of the above as 'methodological hindrances' to which one must attend before demographic inferences can be sustained. But might not these 'methodological hindrances' in fact signal that something is amiss with the regional studies paradigm, which we dismiss at our peril? Other empirical indicators suggest this to be true. Firstly, Sutton (1994), in her analysis of contemporary Greek settlement systems, highlights two dynamics: that of the community as a coalition of a patriline that is constantly being negotiated, and that of the geographic reference of these communities. Communities are 'of the moment,' as are the spatial loci of settlements occupied by communities. One could dismiss

this settlement instability as a product of modernity, but we appreciate that some of the circumstances of modernity that affect settlement stability long have been felt in the Mediterranean (Cherry 1983: 376–77); indeed, this is one of its unique features as an arena for research on humans through time.

Secondly, when archaeological temporal indicators of finer resolution are available, they reveal much more settlement instability. For instance, radiocarbon dates from excavations on the Hungarian Plain indicate multiple, shifting occupations responsible for creating a surface expression that to the eye indicates continuous occupation by a large population (Chapman 1999). Similarly, comparing the record from Cycladic mortuary contexts with that from site survey, Whitelaw (2001) again finds evidence for settlement instability operating at a level not currently resolvable using survey ceramic data.

These many paradigmatic dissonances point toward a set of formational principles (*i.e.* a metaphysic) that underlie the conduct of surface archaeology, very different from the functional principles underpinning regional studies (Wandsnider and Holdaway 2003). Rather than surface variation being solely or even mostly attributable to functional settlement behaviors, the archaeological landscape is recognized fundamentally as a formational and taphonomic entity (Cherry 1983; Cherry *et al.* 1991; Dunnell 1992). Importantly, archaeological materials, being durable and substantive, are not of any ‘one functional moment,’ but potentially and actually of ‘many functional moments.’ To treat formational entities as functional units, whether empirical or conceptual, is to make them temporally flat (Bailey 1983) – *i.e.* as attributable to narrow spans of time, and thus, to deny their formational heritage (Rossignol and Wandsnider 1992; Murray, forthcoming). As Dunnell notes more generally:

No one would contest that settlements, camps, villages, activity loci, and the like can produce what we see today as more or less dense clusters of artifacts, but there is no necessary relation between such ethnographic concepts, many of which are themselves suspicious as units of ethnographic observation, and high-density clusters of artifacts. Not all such clusters are the product of behaviors implied by the ethnographic categories, nor do all such ethnographic units leave high-density artifact clusters. Settlement, occupation, and activities are not agents of deposition; at best they are highly interpretive summaries of relations among such agents. Sites are not units of deposition; they are accretionary phenomena. The historical relatedness of their pieces is highly variable and not directly correlated with spatial proximity (Dunnell 1992: 27).

In that settlement pattern studies depend on flawed units of sites and settlements, they, too, must be suspected as equally flawed. Dewar and McBride (1992) add time to the equation and argue that we should conceptualize our

surface deposits not in terms of settlement patterns, but as remnant settlement patterns (*i.e.* patterns due to the operation of settlement over the short-, medium-, and long-term). In this case, pattern reflects not function, but a history that includes both rare and common events. The distinction may seem semantic rather than substantive, but it betrays a fundamentally different metaphysical commitment.

That the settlement pattern vehicle is so entrenched in current archaeological practice is perhaps the consequence of two things. One is the ‘tyranny of familiar materials’ (after Plog 1974). We see things in the field that are interpretable using our well-tested common-sense (*sensu* Dunnell 1982). It takes little effort to extend experientially-informed ideas about pots and structures into the past. Likewise, Alcock (1993: 24–32) refers to a ‘tyranny of historical documents,’ similar to Wobst’s (1978) ‘tyranny of the ethnographic record.’ These records appear so much richer than archaeological materials that they are also regarded as necessarily more accurate; and indeed they can be, but only for very narrow temporalities. Nevertheless, we feel compelled to hold archaeological materials to a ‘quick-time’ ethnographic standard, when in reality they inform on temporalities of different orders (Binford 1981a).

The second reason why settlement pattern studies are so attractive is that they sometimes seem to work. That is, when the historic period is considered, there appears to be some agreement between the two records, historical and settlement pattern (*e.g.* Athanassopoulos 1997; Bintliff 1991b). The question to be asked, then, is why this agreement exists, rather than to extend apparent agreement into the past.

In short, the regional studies/settlement pattern paradigm, like Icarus’ wings, is simply not working. Its underpinning metaphysic and chronotype (or model of causation, agent, and temporality) have been queried and it has failed various methodological challenges. But, as discussed below, there is more than one way to solve the puzzle of the Labyrinth, and more than one way to fly.

### *Time Perspectivism*

Since the mid-1980s, several changes have occurred in how Mediterranean landscapes are approached. For one, an orienting concept of ‘landscape’ has appeared, incorporating and reconfiguring that of the earlier ‘regional studies’ orientation (Anschuetz *et al.* 2001; Kardulias 1994; Knapp and Ashmore 1999). Concordant with the shift to a landscape perspective, another chronotype – this one multi-temporal, wherein causation is complex and not proximally attributable – has appeared in Mediterranean landscape archaeology. It takes several forms, from an antecedent in the *Annales* School (Barker 1995; Bintliff 1991b; 1999b; Cherry 1983; Knapp 1992), from McGlade’s (1995; 1999a, b) eco-dynamics, and from Bailey’s (1981; 1983; 1987) time perspectivism.

Bintliff’s (1991b; 1999b) adaptation of the *Annales*

construct is multi-temporal and distinguishes between structures (arising from almost imperceptible medium- and long-term processes) and the events of daily life constrained by those structures. In practice, archaeologists emphasize that archaeology is well-suited to seeing the material results of the operation of medium-term processes – Bintliff points to agrarian and political cycles – which may be further animated or elaborated upon by short-term data coming from texts when available. Furthermore, the longer-term structures that operate as contingent factors influencing shorter-term historical trajectories are exposed through comparative historical analysis. For example, he compares the emergence of the Greek city-states (in the context of no constraining political power) to the western European Medieval landscape (wherein powerful states and feudal lords did not allow the development of Greek-like city-states; Bintliff 1999b). Each historical trajectory is a contingent response to a biological structural constraint of how effective communication occurs as population size increases. In the case of Greek city-states, while population sizes were large, the development of a hierarchy meant that rather fewer members of that population were in fact effective communicators. In the case of western Medieval Europe, communication stress precipitated fissioning and the landscape became populated by small villages, with all villagers participating as effective communicators.

Bintliff's structural-contingent approach considers causation as hierarchical; processes operating over the longer-term frame those operating over the shorter-term. His approach is evolutionary, in the sense that different historical trajectories follow from different contingencies. For him, while proximate causation is complex, ultimate causation is attributed to demographic change and, in the example here, to the biological constraint of information processing. Perhaps because of the commitment to demographic change driving critical aspects of culture change, Bintliff feels compelled to discuss demographic entities, like settlements and villas. But his analysis depends not on settlements and villas *per se*, but on indicators of structural organization: the presence of a powerful hierarchy in the case of western Medieval Europe and its lack in the Greek case; the size and degree of integration of populations in each case; the degree to which all individuals or only some individuals are counted as effective communicators. In other words, he does not require fully developed functional entities, but indications that particular conditions hold (powerful hierarchy; integrated communities that are smaller or larger than communication threshold; many *vs.* few effective communicators).

In McGlade's (1995; 1999a; 1999b) eco-dynamics, a multi-temporal construct comes from an understanding of complex, nonlinear systems as applied in the New Ecology. For him, time is inherent in biological, economic, political and ideological processes. Space is socially constructed and time-dependent (as discussed by Sutton [1994] for ethnographically documented Greek villages). Nonlinear interactions have their own complex dynamic and these

may lead to the reorganization of the social-natural system; thus, small-scale events are important because they can be a source of major change. Landscape structure emerges as a result of the operation of social and natural processes with different temporalities. McGlade suggests we eschew concepts of adaptation and system stability for those of self-organization and system resilience, and proposes to map system resiliency in terms of bifurcation history. Yet, despite his example (McGlade 1999a), it remains unclear (to me, at least) how this is effected in the field or laboratory.

Time perspectivism refers to Bailey's (1981; 1983; 1987) biologically-based hierarchical scheme of time – *i.e.* of multiple, systemic-realm processes operating at a variety of rates. In a seminal paper, Bailey (1983) argued that 'past behaviour represents an amalgamation and intersection of many different processes operating over different time spans and defined by different time boundaries.' He elaborated:

(a) that there are essentially only two scales of behavior – long-term and short-term; (b) that long-term processes are dominated by environmental and biological interactions, by relationships between genetics, demography, and economic exploitation of the natural environment, whereas short-term processes are dominated by social and psychological processes, by social rules and relationships and individual goals and motivations; [and] (c) that behavior at these different scales requires different sorts of explanations expressing varying degrees of proximate or ultimate causation and varying emphasis on historical (in terms of the past), functional (in terms of the present), or teleological (in terms of the future) causes (Bailey 1983: 180).

It can be noted that Murray (1999) amends Bailey's hierarchical construct, saying that it is likely that many processes, operating at many temporal scales, are at work.

Bailey (1983) thus explicitly addressed the role of causation and the nature of explanation. For those processes operating at different time-scales, they may be viewed as hierarchical and independent of each other, as for Bintliff (1999b). For those processes operating at similar or overlapping time scales, then interactions become important. Fletcher (1992; 1995), for example, focuses on various interacting medium-scale processes related to communication stress and architecture in communities.

Importantly, Bailey (1981:110) explicitly acknowledged the ontological nature of archaeological deposits, seeing them as being due to temporal and social aggregates of human behavior occurring over archaeological time (hundreds to thousands of years) rather than ethnographic time (one to ten years). Only in the last decade has this aspect of time perspectivism, also alluded to in Binford's (1981a) discussion of the 'Pompeii Premise,' been widely appreciated and actively pursued. That is, Knapp (1992), Murray (1997; 1999) and Smith (1992) have explicitly linked the time-averaged, formational nature of archaeo-

logical deposits to multi-temporal chronotypes, like time perspectivism and the *Annaliste* schemes.

The units necessary to undertake interpretation within a multi-temporal chronotype that acknowledges the formational nature of the archaeological landscape have not been well discussed. Sullivan (1978: 195) points to *traces*, alterations in the physical properties of an object (or relations between objects and a surface or the relations between surfaces) and their accumulation by artifacts and surfaces as their formational history unfolds. Dunnell (1992: 34) has specifically commented on this topic, emphasizing that artifacts and artifact attributes represent fundamental formational units, which may thus serve as empirical units. By extension, feature elements, the atoms of which features are made and remade, may also serve in this fundamental formational capacity.

Conceptual units, constructed from formational empirical units, are also under-discussed and under-developed. Barton *et al.* (1999; 2002) offer one treatment, giving substance to the conceptual unit of settlement intensity. This analysis relies on functional entities (tools), rather than formational entities. Settlement intensity is determined on the basis of the spatial and temporal distribution of tool densities across the landscape, prorated for length of time period.

Other conceptual tools are offered by Stern, who focuses on deposits at Olduvai Gorge and their potential information content (Stern 1993; 1994; 1995; Stern *et al.* 2002). Specifically, she notes that at Olduvai, the fluvial nature of those deposits constrains their minimum temporal resolution. In fluvial systems, deposits of cultural and faunal remains may represent primary accumulations, but also secondary or tertiary reworked accumulations flushed from a variety of older temporal planes from throughout the basin. In the case of the Okote member at Koobi Fora, Stern argues that these remains accumulated over a span of 60,000 to 70,000 years, with the temporal boundaries of the sedimentary envelope defined by a dateable ash lens (on the bottom) and a calcareous sandstone lens (on the top). Cultural and faunal remains, thus, are time-averaged over this span; finer temporal slices cannot be securely identified and patterning in them is attributable to multiple agents, including hominids, the ecological organization of communities in which hominids participated, taphonomic processes, fluvial events, and so on. Attempts to interpret cultural and faunal remains from the Okote member in terms of behavioral or even ecological processes, thus, are sadly misdirected. Since the minimum temporal resolution of this deposit is 60,000–70,000 years, only processes with frequency on the order of 150,000 years or longer can be addressed. Stern – echoing Binford (1981a) and Bailey (1981), and anticipating Murray and Chapman – is emphatic that archaeologists recognize archaeological deposits for what they are: time-averaged entities:

The potential of the... archaeological record for enhancing our understanding of human behavioural

evolution derives not only from the long time span it offers but also from the time resolution of the archaeological materials being studied. However, this unique potential cannot be exploited unless researchers are willing to first acknowledge the singular character of the archaeological record and second to explore uncharted theoretical ground that provides a more appropriate understanding of these data as a record of human action (Stern 1993: 202).

A final aspect of time perspectivism pertains to measurement decisions. Three strategies for using archaeological materials to learn about temporalized conditions appear to be available (Wandsnider, forthcoming). For one, we can elect to look at our landscape assemblages in terms of *point indicators* – functionally specific artifacts, features, assemblages or surfaces that originated at a particular (narrow) point in time, presumably reflecting and informing on prevailing conditions. Archaeologists routinely consider the temporal and spatial distribution of such point indicators to infer prevailing conditions. For example, Alcock (1993: 172–214) looks at the contextual development of the sacred landscape, as indicated in the spatial and temporal distribution of cult sites and sanctuaries. Crumley and Marquardt (1987) consider the find population of artifacts from different time periods with respect to different geostructural features, to make arguments for the role those features played in people's lives. Wells (1999) focuses on the population of graves and their contents with respect to the changing Roman frontier to infer the nature of tribal-Roman interaction.

Secondly, Chapman (1999) suggests focusing on changes in monuments, Plog (1979) considered changes in surface use, and Alcock (1993) looks at displaced cults and the 'symbolic violence' they may indicate. (See also contributions to *World Archaeology* [1998] on the theme 'The Past in the Past.') That is, these researchers rely on *material histories* that relate to and inform on changing conditions. People construct monuments that serve as lightning rods for further human activity, be it augmentive or destructive. For example, Chapman (1994) reports on the deliberate damage and destruction of more than 50% of the mosques in Bosnia and Hercegovina during the recent conflict there. Assuming that damaged buildings and building foundations persist, these will serve as material testimony both to their construction and to their damage and destruction. Of course, based on archaeological evidence alone, it may be difficult to establish that such massive destruction occurred during a very short interval of time; and the conditions about which these material histories inform us remain to be established through middle-range research and an elaboration of their contexts of discovery.

Finally, we can elect to look at the distinctive character of assemblages that accumulate over a span of time and, based on that character, infer prevailing conditions. For example, the relative ratio of thick-walled, long-lived storage vessels compared with fragile, short-lived, fine

table vessels at a location informs possibly on function (that storage and dining activities occurred here), but also potentially on the length of occupation (*i.e.* occupation stability). Similarly, Foxhall (2000) discusses long-lived sanctuaries and the short-lived votive offerings they attracted. Qualitative, comparative analysis of an aggregate assemblage that includes short-lived and long-lived artifacts or features, or artifacts and features that are introduced into the archaeological record at very different rates, may inform as *span indicators* of prevailing conditions.

Time perspectivism encompasses the view that archaeological deposits are created by many different processes operating at many different tempos, similar to that discussed by Bintliff and McGlade. Some of those contributing processes and temporalities are knowable, as set by the temporal resolution of the assemblage. But time perspectivism also focuses analytic attention on the material implications of those processes, considering artifacts, features, and surfaces, or landscapes and their material histories. As such, time perspectivism embraces a formational metaphysic.

#### WESTERN ROUGH CILICIA

Since 1998, the Rough Cilicia Project, based in southern Turkey (Figure 5.1), has been experimenting with the collection and integration of a variety of different historical and material data sources. Ultimately, we want to say something about how the ‘local’ Cilician population, likely derived from indigenous and Mediterranean-wide sources, interacted with various expanding cores through the Hellenistic and Roman periods. We have some Classical references to the area, but these are very geographically and temporally coarse; historical texts in the form of inscriptions are also available. Moreover, using pollen and macrobotanical data, we are presently building a paleoenvironmental sequence for the area. Here, I detail an approach that has evolved over the last four years of fieldwork for developing information on past processes and their temporalities as evidenced materially. Of course, the very interesting exercise upon which we are just now embarking is the integration of these various strands of evidence. The following brief discussion is organized in terms of *surfaces*, *features*, and *artifacts and artifact assemblages*.

#### *Surfaces*

Landscape surfaces are the dynamic and evolving stage on which people, past and present, organize themselves, plants and animals, and technology (McGlade 1995). But just as artifacts and features on the contemporary archaeological landscape can be considered palimpsests (*i.e.* lingering from remote points of introduction), the modern landscape is a mosaic of surfaces of different ages and subject to different geomorphological processes (Barton

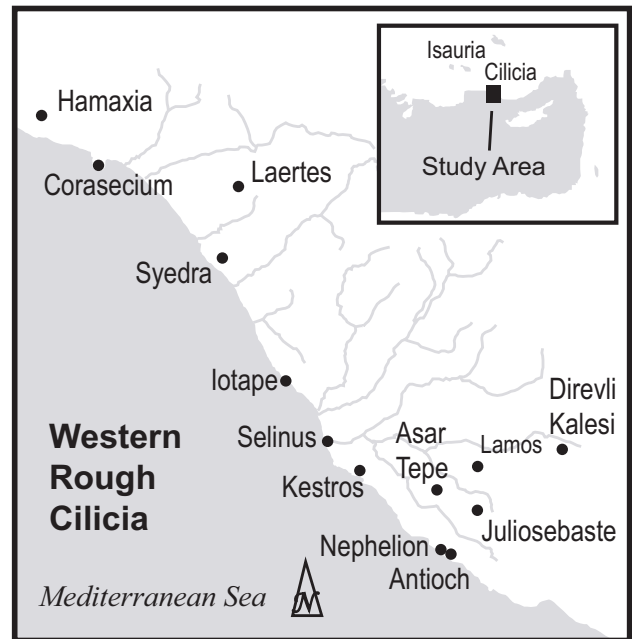


Figure 5.1 Western Rough Cilicia study area, showing cities known through historic and epigraphic texts.

*et al.* 2002; Bettis and Mandel 2002). This has several important implications. For one, surfaces of the time period of interest to us may be buried (van Andel and Runnels 1987), or they may be present but contain transported assemblages. Thus, much geoarchaeology over the last 20 years has focused on establishing chronostratigraphy and on understanding the formation of deposits (Mandel 2000; Stein 2000). Wells (2001) nicely describes laboratory and field techniques useful in defining morphostratigraphic (similarly appearing) and chronostratigraphic (chronologically sequenced) units for archaeological survey.

But a corollary observation deserves mention: the ages of contemporary surfaces in a study area will not all be the same. Furthermore, different surfaces represent different samples of time and taphonomy (Bettis and Mandel 2002). In other words, morpho-chronostratigraphic units can be further discriminated as *taphostratigraphic* units, *i.e.* surfaces exposed for about the same length of time and being affected by the same suite of surface processes. (Paleontologists argue that paleontological assemblages be compared among and between *isotaphonomic* units [Behrensmeyer 1991].) Moreover, as discussed above for time-averaged assemblages, different processes are accessible with different taphostratigraphic units with assemblages that are differentially time-averaged.

The distinction I am making is subtle but important. Wells (2001) and others (Barker 1995; Bintliff *et al.* 1999; van Andel and Runnels 1987) are interested in learning what fraction of the landscape might be eroded or buried, because of the commitment to a sited, synchronic, essentialist metaphysic. But if the landscape is approached as a formational phenomenon, then it is important to identify

quasi-taphostratigraphic units, because they define the temporality of the processes and process temporalities that can be addressed archaeologically (Bettis and Mandel 2002). The completeness of a settlement pattern is not an issue.

In the Rough Cilicia study area, Sancar Ozaner (see Rauh and Wandsnider 2002) has developed a morpho-stratigraphic map that serves as the base from which to develop a taphostratigraphic map. The latter takes into account not only surface ages and geomorphological processes, but also where modern fields provide good surface exposure and the degree to which looting makes available subsurface remains in and around architecture.

Coarse-grained Phase 1 of the field survey was designed to locate all massive architecture. With this information, we are now looking to sample taphostratigraphic units of different ages, time spans, and surface process suites.

### Features

Features can be considered both as point indicators and in terms of their material histories. For example, several Roman baths are preserved in the study area. Their presence advertises a commitment of some members of the local populace to participation in the pan-Mediterranean ethos of what it means to be a good Roman. But exactly when and for how long this sentiment held is something we are presently trying to establish.

Similarly, the fact that large architectural aggregates are found on hilltops which, through independent analysis, appear to be selected for their defensibility suggests that security issues were prominent at times in the Hellenistic past. That either the need for, or the mode of, defense was not constant is implied by the lack of fortification walls at the site of Asar Tepe (with much early Roman pottery; see Figure 5.1); but the fortification walls at the massive site of Lamos, with later Roman and Byzantine ceramics, suggest that security issues again became important. It is vital to note, however, that the siting of a settlement or the construction of a fortification wall has long-term material consequences that persist in time beyond the presence of initial condition, such as a threat. The walls at Lamos are intact today, yet defend against no one.

Other work on architecture attempts to address the construction history at specific locations. Consistency in building styles, ceramic sherds in the mortar, and the degree to which construction appears agglutinated (or not) assist in this respect. (With limited success, we have also experimented with lichenometric dating and limestone weathering as ways independently to date architectural elements.) Subsurface testing will prove critical in developing construction histories for particular places.

### Artifacts and Artifact Assemblages

Our 2002 field methods involved sampling survey units in different taphostratigraphic strata. Units are the size of

fields, or smaller areas (c. 50 x 50 m) are established as our analytic units. Within the unit, we walk transects about 5 m apart and flag artifacts along a 1-m wide transect. All temporally diagnostic sherds, as well as all rim, base, and handle sherds, are described (data entered in the field in hand-held computers) and mapped using hand-held GPS devices (yielding a spatial resolution of 20 m). An un-systematic walk through the unit is also carried out to locate other temporally interesting sherds. Description includes information on chronotype (*sensu* Gregory, forthcoming), form, size, temper, interior and exterior markings, and rim and base radius estimates. Sherds designated as interesting are photographed and sherds identified as potentially temporally diagnostic are returned to the field laboratory.

Needless to say, these field documentation procedures are very time-consuming. This investment is warranted by the information they yield beyond standard temporal information. For example, sherd size distributions inform on the formation history of the deposit. Small, battered sherds were found on the Haçımusa floodplain and represent a sample from throughout the Haçımusa catchment; large sherds, exposed by looters, occur amidst architecture; and intermediate-to-large sherds occur in cultivated fields, telling us about how the plowzone is being sampled.

More importantly, artifacts, by their presence, also communicate information about local conditions. The presence of an African Red Slip sherd indicates that some sort of interaction with North Africa occurred at some point in time contemporaneous with or after the production of such wares. We look to the population of sherds from exotic vessels to help establish the nature and timing of that interaction (Millett 2000). The presence of press- and grinding-stones likewise indicates something about mode of production.

The issue of how to report sherd finds is likewise being addressed (Orton 1993). Should one large storage vessel sherd be counted the same as one small fineware sherd? Should they instead be counted in terms of portions of vessels represented? Should they be inventoried in terms of vessel use-life or relative vessel cost or vessel adaptability? Because of the measurements made in the field, we can begin to pose questions of this kind. Ultimately, we plan to develop a series of ratio measures to use in characterizing the history of arbitrarily defined assemblages sampled from taphostratigraphic strata.

From his analysis of the Iron Age Princely grave at Hochdorf, Olivier (1999) offers a model for how to incorporate material histories into multi-temporal narratives about the past. These approaches – along with analyses of Cilician myths in the Luwian language of Anatolia, and textual and inscriptional evidence – will be used to approach a developmental history of the dynamic, socio-natural landscape of western Rough Cilicia.

## METHODOLOGICAL ISSUES

While time perspectivism seated in a formational paradigm may seem another form of empiricism, that is only because our inferential tools are still under development. Nevertheless, their development is essential. The scientific positivism explicitly embraced by the early New Archaeology during the 1960s and 1970s has been supplanted by a mitigated objectivism (Wylie 1982; 1989a; 1989b; 1995), in which knowledge about the past is constituted in terms of independent and (to greater or lesser degrees) secure inferential tools – *i.e.* Binford's (1981b) middle-range theory. That this solution to the fundamental interpretive dilemma of archaeology has been widely recognized (*contra* Cunningham and Driessen, Ch. 8, this volume) is evident in work of a diverse group of researchers (*e.g.* Hodder 1999; Tilley 1994; Trigger 1995). Nevertheless, interpretation of processes with different tempos using material histories is hardly a simple matter. The same issues that concern archaeological inference in general apply here as well.

Middle-range theories and bodies of reference knowledge used to undergird inferences have typically been built using observations made during short-term actualistic studies. Bailey (1983) suggests that, of and by themselves, such studies cannot be extended to interpret the long-term, although what he appears to be critiquing is analogical reasoning supported by a substantive uniformitarianism (Gould 1965). Some instrumental knowledge (*i.e.* knowledge used for making inferences) is of this sort – *e.g.* portraits of the supposedly timeless Greek farmers used as analogs for earlier agriculturalists, as critiqued by Fotiadis (1995). But all instrumental knowledge need not be analogical or conventional. For example, understanding the placement of threshing floors on ridge crests, where strong breezes winnow away the chaff, is a type of knowledge that is timeless and spaceless (*i.e.* Gould's [1965] methodological uniformitarianism), but that must be used in contextually informed ways. In other words, understanding that chaff is lighter than wheat helps us understand that threshing floors occur on ridgetops, but not necessarily *which* ridgetops.

Murray (1997), however, is not convinced that observations made in the short-term can be used to understand medium-term processes. He, especially, seeks the Holy Grail of social theory of the medium- to long-term that has archaeological referents, suggesting four strategies for developing this theory:

1. Search for anomalous events or situations that challenge our understanding of the past (similar to a learning strategy offered by Richard Gould [1978]; and see Stephen Jay Gould [1986] for a discussion of the 'panda principle').
2. Establish performance limits for theory with regard to the empirical archaeological record.
3. Search for a body of theory that more directly speaks to the problem of palimpsest and scale than current

social theory does. In fact, many possible theoretical constructs are available in anthropology. But, Murray would emphasize that they must be refashioned to make them archaeologically accessible in a way that does not make ontologically unsupportable demands of the archaeological record. Fletcher (1992; 1995), for example, depends on communication theory to look at the flow of information in communities of various sizes and uses it to predict when settlements may approach a communicative crisis as population size increases. When these communication thresholds are approached, settlements may be reconfigured and Fletcher details expectations for what remodeling should look like.

4. Engage in fiction writing at different temporal scales.

Curiously, Murray does not suggest the strategy that has been offered up several times (Clarke 1973; Sabloff 1986; Smith 1992; Snodgrass 1985): to use the historical record to build inferential tools. It may be that such middle-range information exists, but has not been organized in a way that is presently useable. For example, when Roman baths are constructed, what set of social, economic, and political conditions do they imply? When they are destroyed by earthquakes and not rebuilt, what conditions might this indicate? What is the temporality of those conditions? Under what conditions are tombs remodeled into temples and temples into baths? Again, what are the social, political and temporal entailments of this material history? Textual records may allow the establishment of such conditions.

Another strategy was pioneered by Darwin (Gould 1986) – that is, the development of an historical hypothesis that specifies various material stages in the operation of a long-term process. Darwin proposed a hypothesis that linked fringeing, barrier and atoll coral reefs, using the historical thread of island subsidence: fringeing reefs first develop and, as the island subsides, grow into barrier reefs, and then atolls. Independent verification (drilling and dating) has since confirmed Darwin's hypothesis. Archaeologists engage in building historical hypotheses all the time – Flannery's (1972) argument about the development of hierarchies being a classic example. The part of the enterprise involving independent verification, however, is often lacking.

Middle-range theory for material histories is also required. It is relatively easy to recognize sequences in assemblage and feature development and modification (Sullivan 1992), but more difficult to draw substantive inferences about those sequences. Sequential modeling (Bleed 2001) embedded in a matrix of knowledge about temporal and spatial distributions of material culture may be useful here.

Finally, middle-range theory for span indicators is also required. Several authors (Binford 1977; Shiner *et al.* forthcoming) consider hunter-gatherer assemblage character as a result of the accumulation of artifacts with different use-lives and discard rates. For example, Binford

(1977) postulates that conditions of tool curation vs. those of expedient material use can be inferred on the basis of various ratios, such as broken to complete tools, cores to tools, and so forth. For these inferences to be supported, however, ethnographic or historical studies on artifact and feature use-lives are critical. Behavioral archaeologists have been investing in such information for decades.

#### CONCLUDING THOUGHTS

The currently embraced paradigm in Mediterranean surface archaeology of regional/settlement pattern studies – seated in flat-time functional metaphysics – is imperiled. As shown by Mediterranean archaeologists, that chronotype does not deal well with either complexity or history. And, attending methods, also as demonstrated by Mediterranean archaeologists, do not consistently accommodate or satisfactorily assign meaning to the varied archaeological landscape. But another formational metaphysics exists and seems better to comprehend the complex, historical world and to acknowledge landscape variation.

Rather than continuing the ‘multiple paradigm disorder’ practice of using intensive non-site methods, best suited to documenting taphonomic variation, in order to pursue flawed functional goals (settlement pattern reconstruction), it seems clear that a full acceptance of the formational metaphysics is in order. Time perspectivism, while still cohering, offers both an understanding of agent, causation, and temporality fundamentally wedded to an understanding of archaeological materials and how they may inform on human and natural processes operating at various temporal scales. Other concepts of time and causation, such as McGlade’s eco-dynamics or Bintliff’s structural-contingency approach, have the potential to speak to the historical complexity of the archaeological landscape, but must be refashioned to engage that landscape in archaeological terms.

Icarus, on steroids and with bird wings of titanium, will be bested by Poseidon or will meet some other lamentable fate. His sister, however, having studied the properties of flight and materials (and if she lives long enough) has the chance to make it out of the Labyrinth. But time is drawing short. In the Mediterranean Basin, agro-business and development have already remodeled extensive portions of the land surface. For this reason, it is essential that the issues of unit definition and of measurement be given top priority. By failing to give such issues the attention they require, survey (especially non-collection survey) not only risks squandering scarce resources, but also perpetuates a complacent charade of formational facts masquerading as functional knowledge.

#### ACKNOWLEDGMENTS

I extend my deep gratitude to Susan Alcock and John

Cherry for making possible the very rich ‘Side-by-Side Survey’ conference and this resulting volume. I am also thankful to my Rough Cilician team-mates – Nicholas Rauh, Michael Hoff, Rhys Townsend, and Matthew Dillon – for their invitation to join the team and thereby think about these matters, which have consumed me for quite some time. Thanks to Simon Holdaway, who has helped in hatching many of the ideas presented here. I thank Peter Bleed, Christopher Dore, and Nicholas Rauh for their comments. I alone am responsible for errors of fact and reason. This material is based upon work supported by the National Science Foundation under Grant No. 0079951. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

#### REFERENCES

- Alcock, S. E. (1993) *Graecia Capta: The Landscapes of Roman Greece*. Cambridge, Cambridge University Press.
- Alcock, S. E. (1994) Breaking up the Hellenistic world: survey and society. In I. Morris (ed.) *Classical Greece: Ancient Histories and Modern Archaeologies*: 171–90. Cambridge, Cambridge University Press.
- Alcock, S. E., Cherry, J. F. and Davis, J. L. (1994) Intensive survey, agricultural practice and the Classical landscape of Greece. In I. Morris (ed.) *Classical Greece: Ancient Histories and Modern Archaeologies*: 137–70. Cambridge, Cambridge University Press.
- Ammerman, A. J. (1981) Surveys and archaeological research. *Annual Review of Anthropology* 10: 63–88.
- Anschuetz, K. F., Willhusen, R. H. and Scheick, C. L. (2001) An archaeology of landscapes: perspectives and directions. *Journal of Archaeological Research* 9: 157–211.
- Ashmore, W. and Knapp, A. B. (eds.) (1999) *Archaeologies of Landscape*. Walden, MA, Blackwell.
- Athanassopoulos, E. (1997) Landscape archaeology of Medieval and pre-Modern Greece: the case of Nemea. In P. N. Kardulias and M. T. Shutes (eds.) *Aegean Strategies: Studies of Culture and Environment on the European Fringe*: 79–105. Lanham, Rowman and Littlefield.
- Athanassopoulos, E. and Wandsnider, L. (forthcoming) Introduction: Mediterranean landscape archaeology past and present. In E. Athanassopoulos and L. Wandsnider (eds.) *Mediterranean Archaeological Landscapes: Current Issues*. (Under review.)
- Bailey, G. (1981) Concepts, timescales and explanations in economic prehistory. In A. Sheridan and G. Bailey (eds.) *Economic Archaeology: Towards an Integration of Ecological and Social Approaches*. British Archaeological Report 96: 97–117. Oxford, British Archaeological Reports.
- Bailey, G. N. (1983) Concepts of time in Quaternary prehistory. *Annual Review of Anthropology* 12: 165–92.
- Bailey, G. (1987) Breaking the time barrier. *Archaeological Review from Cambridge* 6: 5–20.
- Barker, G. (1995) *A Mediterranean Valley: Landscape Archaeology and Annales History in the Biferno Valley*. London, Leicester University Press.
- Barker, G. and Mattingly, D. (series eds.) (1999; 2000) *The Archaeology of Mediterranean Landscapes*. Oxford, Oxbow Books.
- Barton, C. M., Bernabeu, J., Aura, J. E. and Garcia, O. (1999)

- Land-use dynamics and socioeconomic change: an example from the Polop Alto Valley. *American Antiquity* 64: 609–634.
- Barton, C. M., Bernabeu, J., Aura, J. E., Garcia, O. and La Roca, N. (2002) Dynamic landscapes, artifact taphonomy, and landuse modeling in the Western Mediterranean. *Geoarchaeology* 17: 155–90.
- Behrensmeier, A. K. (1991) Terrestrial vertebrate accumulations. In P. A. Allison and D. E. G. Briggs (eds.) *Taphonomy: Releasing the Data Locked in the Fossil Record* (Vol. 9): 291–335. New York, Plenum Press.
- Bender, J. and Wellbery, D. E. (1991) Introduction. In J. Bender and D. E. Wellbery (eds.) *Chronotypes: The Construction of Time*: 1–15. Stanford, Stanford University Press.
- Bennet, J. and Galaty, M. (1997) Ancient Greece: recent developments in Aegean archaeology and regional studies. *Journal of Archaeological Research* 5: 75–120.
- Bettis, E. A., III and Mandel R. E. (2002) The effects of temporal and spatial patterns of Holocene erosion and alluviation on the archaeological record of the Central and Eastern Great Plains, U.S.A. *Geoarchaeology* 17: 141–54.
- Binford, L. R. (1977) Forty-seven trips: a case study in the character of archaeological formation process. In R. V. S. Wright (ed.) *Stone Tools as Cultural Markers*: 24–36. Canberra, Australian Institute of Aboriginal Studies.
- Binford, L. R. (1981a) Behavioral archaeology and the ‘Pompeii Premise’. *Journal of Anthropological Research* 37: 195–208.
- Binford, L. R. (1981b) *Bones: Ancient Men and Modern Myths*. New York, Academic Press.
- Bintliff, J. L. (ed.) (1991a) *The Annales School and Archaeology*. Leicester, Leicester University Press.
- Bintliff, J. L. (1991b) The contribution of an *Annaliste*/structural history approach to archaeology. In J. L. Bintliff (ed.) *The Annales School and Archaeology*: 1–33. Leicester, Leicester University Press.
- Bintliff, J. L. (1999a) Regional field surveys and population cycles. In J. L. Bintliff and K. Sbonias (eds.) *Reconstructing Past Population Trends in Mediterranean Europe (3000 BC – AD 1800)*: 21–33. Oxford, Oxbow Books.
- Bintliff, J. L. (1999b) Structure, contingency, narrative, and timelessness. In J. L. Bintliff (ed.) *Structure and Contingency in the Evolution of Life, Human Evolution, as Human History*: 132–148. London, Leicester University Press.
- Bintliff, J. L., Howard, P. and Snodgrass, A. (1999) The hidden landscapes of prehistoric Greece. *Journal of Mediterranean Archaeology* 12: 116–23.
- Blanton, R. E. (2001) Mediterranean myopia (Review of G. Barker and D. Mattingly (series eds.) *The Archaeology of Mediterranean Landscapes*, Oxford, Oxbow Books 1999–2000). *Antiquity* 75 (289): 627–29.
- Bleed, P. (2001) Trees or chains, links or branches: conceptual alternatives for consideration of stone tool production and other sequential activities. *Journal of Archaeological Method and Theory* 8: 101–127.
- Braidwood, R. (1937) *Mounds in the Plain of Antioch: An Archaeological Survey*. Chicago, University of Chicago Oriental Institute Publication.
- Chapman, J. (1994) Destruction of a common heritage: the archaeology of war in Croatia, Bosnia, and Hercegovina. *Antiquity* 68: 120–26.
- Chapman, J. (1999) Archaeological proxy-data for demographic reconstructions: facts, factoids, or fiction? In J. L. Bintliff and K. Sbonias (eds.) *Reconstructing Past Population Trends in Mediterranean Europe (3000 BC – AD 1800)*: 65–76. Oxford, Oxbow Books.
- Cherry, J. F. (1983) Frogs around the pond: perspectives on current archaeological survey projects in the Mediterranean region. In D. R. Keller and D. W. Rupp (eds.) *Archaeological Survey in the Mediterranean Area*. BAR International Series 155: 375–416. Oxford, British Archaeological Reports.
- Cherry, J. F. (1994) Regional survey in the Aegean: the ‘New Wave’ (and after). In P. N. Kardulias (ed.) *Beyond the Site: Regional Studies in the Aegean Area*: 91–112. Lanham, University Press of America.
- Cherry, J. F., Davis, J. L. and Mantzourani, E. (1991) *Landscape Archaeology as Long-Term History: Northern Keos in the Cycladic Islands*. Monumenta Archaeologica 16. Los Angeles, Institute of Archaeology, University of California.
- Clark, G. A. (1994) Migration as an explanatory concept in Paleolithic archaeology. *Journal of Archaeological Method and Theory* 1: 305–344.
- Clarke, D. L. (1973) Archaeology and the loss of innocence. *Antiquity* 46: 6–18.
- Crumley, C. L. and Marquardt, W. H. (eds.) (1987) *Regional Dynamics: Burgundian Landscapes in Historical Perspective*. San Diego, Academic Press.
- Daniel, G. (1975) *A Hundred and Fifty Years of Archaeology*. London, Duckworth.
- Dewar, R. E. (1991) Incorporating variation in occupation span in settlement-pattern analysis. *American Antiquity* 56: 604–620.
- Dewar, R. E. and McBride, K. A. (1992) Remnant settlement patterns. In J. Rossignol and L. Wandsnider (eds.) *Space, Time, and Archaeological Landscapes*: 227–55. New York, Plenum Press.
- Dunnell, R. C. (1982) Science, social science, and common sense: the agonizing dilemma of modern archaeology. *Journal of Anthropological Research* 38: 1–25.
- Dunnell, R. C. (1988) Low-density archaeological records from plowed surfaces: some preliminary considerations. In L. Wandsnider and J. Ebert (eds.) *Issues in Archaeological Surface Survey: Meshing Method and Theory*. *American Archaeology* 7(1): 29–37. Ridgefield, CT, Atechiston Press.
- Dunnell, R. C. (1992) The notion site. In J. Rossignol and L. Wandsnider (eds.) *Space, Time, and Archaeological Landscapes*: 21–41. New York, Plenum Press.
- Dunnell, R. C. and Dancy, W. S. (1983) The siteless survey: a regional-scale data collection strategy. In M. B. Schiffer (ed.) *Advances in Archaeological Method and Theory*, Vol. 5: 267–87. New York, Academic Press.
- Dyson, S. L. (1982) Archaeological survey in the Mediterranean basin: a review of recent research. *American Antiquity* 47: 87–98.
- Fish, S. (1999) Conclusions: the settlement pattern concept from an Americanist perspective. In B. R. Billman and G. Feinman (eds.) *Settlement Pattern Studies in the Americas: Fifty Years since Virú*: 203–208. Washington, D.C., Smithsonian Institution Press.
- Flannery, K. V. (1972) The cultural evolution of civilizations. *Annual Review of Ecology and Systematics* 3: 399–426.
- Fletcher, R. (1992) Time perspectivism, *Annales*, and the potential of archaeology. In A. B. Knapp (ed.) *Archaeology, Annales, and Ethnohistory*: 35–50. Cambridge, Cambridge University Press.
- Fletcher, R. (1995) *The Limits of Settlement Growth*. Cambridge, Cambridge University Press.
- Foley, R. A. (1981) A model of regional archaeological structure. *Proceedings of the Prehistoric Society* 47: 1–17.
- Fotiadis, M. (1995) Modernity and the past-still-present: politics of time in the birth of regional archaeological projects in Greece. *American Journal of Archaeology* 99: 59–78.
- Foxhall, L. (2000) The running sands of time: archaeology and the short-term. *World Archaeology* 31: 484–98.
- Gallant, T. W. (1986) ‘Background noise’ and site definition: a contribution to survey archaeology. *Journal of Field Archaeology* 13: 403–418.

- Given, M., Knapp, A. B., Meyer, N., Gregory, T. E., Kassianidou, V., Noller, J., Wells, L., Urwin, N. and Wright, H. (1999) The Sydney Cyprus Survey Project: an interdisciplinary investigation of long-term change in North Central Troodos, Cyprus. *Journal of Field Archaeology* 26: 19–39.
- Gould, R. A. (1978) Beyond analogy in ethnoarchaeology. In R. A. Gould (ed.) *Explorations in Ethnoarchaeology*: 249–93. Albuquerque, School of American Research, University of New Mexico Press.
- Gould, S. J. (1965) Is uniformitarianism necessary? *American Journal of Science* 263: 223–228.
- Gould, S. J. (1986) Evolution and the triumph of homology, or Why history matters. *American Scientist* 74: 60–69.
- Gowlett, J. A. J. (1997) High definition archaeology: ideas and evaluation. *World Archaeology* 29: 152–71.
- Gregory, T. E. (forthcoming) Less is better: the quality of ceramic evidence from archaeological survey and practical proposals for low-impact survey in a Mediterranean context. In E. Athanasopoulos and L. Wandsnider (eds.) *Mediterranean Archaeological Landscapes: Current Issues* (Under review.)
- Hamond, F. W. (1978) The contribution of simulation to the study of archaeological processes. In I. Hodder (ed.) *Simulation Studies in Archaeology*: 1–9. Cambridge, Cambridge University Press.
- Hodder, I. (1999) *The Archaeological Process: An Introduction*. Oxford, Blackwell.
- Hope Simpson, R. (1983) The limitations of surface surveys. In D. R. Keller and D. W. Rupp (eds.) *Archaeological Survey in the Mediterranean Area*. BAR International Series 155: 45–49. Oxford, British Archaeological Reports.
- Hope Simpson, R. (1984) The analysis of data from surface surveys. *Journal of Field Archaeology* 11: 115–17.
- Jacobsen, T. W. (2000) Background of the Franchthi Project. In W. R. Farrand (ed.) *Depositional History of Franchthi Cave: Sediments, Stratigraphy, and Chronology*, Vol. 12: 1–10. Bloomington, Indiana University Press.
- Kardulias, P. N. (1994) Paradigms of the past in Greek archaeology. In P. N. Kardulias (ed.) *Beyond the Site: Regional Studies in the Aegean Area*: 1–23. Lanham, University Press of America.
- Kardulias, P. N., Gregory, T. E. and Sawmiller, J. (1995) Bronze Age and Late Antique exploitation of an islet in the Saronic Gulf, Greece. *Journal of Field Archaeology* 22: 3–21.
- Keller, D. R. and Rupp, D. W. (eds.) (1983) *Archaeological Survey in the Mediterranean Area*. BAR International Series 155. Oxford, British Archaeological Reports.
- Knapp, A. B. (1992) Archaeology and *Annales*: time, space, and change. In A. B. Knapp (ed.) *Archaeology, Annales, and Ethnohistory*: 1–21. Cambridge, Cambridge University Press.
- Knapp, A. B. and Ashmore, W. (1999) Archaeological landscapes: constructed, conceptualized, ideational. In W. Ashmore and A. B. Knapp (eds.) *Archaeologies of Landscape*: 1–30. Walden, MA, Blackwell.
- Kuhn, T. S. (1970) *The Structure of Scientific Revolutions*. Chicago, University of Chicago Press.
- Mandel, R. E. (2000) Introduction. In R. E. Mandel (ed.) *Geoarchaeology in the Great Plains*: 3–9. Norman, University of Oklahoma Press.
- McDonald, W. M. and Rapp, G. R., Jr (eds.) (1972) *The Minnesota Messenia Expedition: Reconstructing a Bronze Age Regional Environment*. Minneapolis, University of Minnesota Press.
- McGlade, J. (1995) Archaeology and the eco-dynamics of human-modified landscapes. *Antiquity* 69: 113–32.
- McGlade, J. (1999a) Archaeology and the evolution of cultural landscapes: towards an interdisciplinary research agenda. In P. J. Ucko and R. Layton (eds.) *The Archaeology and Anthropology of Landscape*: 458–82. London, Routledge.
- McGlade, J. (1999b) The times of history: archaeology, narrative and non-linear causality. In T. Murray (ed.) *Time and Archaeology*: 141–63. London, Routledge.
- Millett, M. (2000) Dating, quantifying and utilizing pottery assemblages from surface survey. In R. Francovich, H. Patterson and G. Barker (eds.) *Extracting Meaning from Ploughsoil Assemblages*: 53–59. Oxford, Oxbow Books.
- Morris, I. (1994) Archaeologies of Greece. In I. Morris (ed.) *Classical Greece: Ancient Histories and Modern Archaeologies*: 8–48. Cambridge, Cambridge University Press.
- Murray, T. (1997) Dynamic modelling and new social theory of the mid- to long-term. In S. E. van der Leeuw and J. McGlade (eds.) *Time, Process and Structured Transformation in Archaeology*: 449–63. London, Routledge.
- Murray, T. (1999) A return to the ‘Pompeii Premise’. In T. Murray (ed.) *Time and Archaeology*: 8–27. London, Routledge.
- Murray, T. (forthcoming) Archbishop Ussher and archaeological time. In L. Vishnyatsky (ed.) *The Archaeologist as Detective: The Leo Klejn Festschrift*. St. Petersburg, Folio Press.
- Olivier, L. (1999) The Hochdorf ‘Princely’ Grave and the question of the nature of archaeological funerary assemblages. In T. Murray (ed.) *Time and Archaeology*: 109–138. London, Routledge.
- Orton, C. (1993) How many pots make five? An historical review of pottery quantification. *Archaeometry* 35: 169–84.
- Parsons, J. R. (1972) Archaeological settlement patterns. *Annual Review of Anthropology* 1: 127–50.
- Plog, F. (1974) *The Study of Prehistoric Change*. New York, Academic Press.
- Plog, F. T. (1979) Alternative models of prehistoric change. In C. Renfrew and K. L. Cooke (eds.) *Transformations: Mathematical Approaches to Culture Change*: 221–36. New York, Academic Press.
- Ramenofsky, A. F. and Steffen, A. (1998) Units as tools of measurement. In A. F. Ramenofsky and A. Steffen (eds.) *Unit Issues in Archaeology*: 3–17. Salt Lake City, University of Utah Press.
- Rauh, N. K. and Wandsnider, L. (2002) Dağlık Kılıkıa Yüzev Araştırma Projesi: 2001 Sezonu Raporu. In *24th International Symposium of Excavations, Surveys and Archaeometry*. 25–29 May 2002, T.C. Kültür Bakanlığı Antılar ve Müzeler Genel Müdürlüğü.
- Renfrew, C. (1972) *The Emergence of Civilization: The Cyclades and the Aegean in the Third Millennium B.C.* London, Methuen.
- Renfrew, C. (1980) The Great Tradition versus the Great Divide: archaeology as anthropology? *American Journal of Archaeology* 84: 287–98.
- Rossignol, J. and Wandsnider, L. (eds.) (1992) *Space, Time, and Archaeological Landscapes*. New York, Plenum Press.
- Sabloff, J. A. (1986) Interaction among Classic Maya polities: a preliminary examination. In C. Renfrew and J. F. Cherry (eds.) *Peer Polity Interaction and Socio-Political Change*: 109–116. New York, Cambridge University Press.
- Sbonias, K. (1999) Investigating the interface between regional survey, historical demography, and paleodemography. In J. Bintliff and K. Sbonias (eds.) *Reconstructing Past Population Trends in Mediterranean Europe (3000 BC – AD 1800)*: 219–34. Oxford, Oxbow Books.
- Schacht, R. M. (1984) The contemporaneity problem. *American Antiquity* 49: 678–95.
- Shiner, J., Holdaway, S., Allen, H. and Fanning, P. (forthcoming) Understanding stone artifact assemblage variability in late Holocene contexts in Western New South Wales, Australia: Burkes Cave, Stud Creek and Fowlers Gap. In C. Clarkson and L. Lamb (eds.) *Rocking the Boat: New Approaches to Stone Artefact Reduction, Use and Classification in Australia*. BAR International Series. Oxford, Archaeopress.
- Smith, M. E. (1992) Braudel’s temporal rhythms and chronology theory in archaeology. In A. B. Knapp (ed.) *Archaeology,*

- Annales, and *Ethnohistory*: 23–33. Cambridge, Cambridge University Press.
- Snodgrass, A. M. (1985) The New Archaeology and the Classical archaeologist. *American Journal of Archaeology* 89: 31–37.
- Stein, J. K. (2000) Stratigraphy and archaeological dating. In S. E. Nash (ed.) *It's About Time: A History of Archaeological Dating in North America*: 14–40. Salt Lake City, University of Utah Press.
- Stern, N. (1993) The structure of the Lower Pleistocene archaeological record. *Current Anthropology* 34: 201–225.
- Stern, N. (1994) The implications of time-averaging for reconstructing the land-use patterns of early tool-using hominids. *Journal of Human Evolution* 27: 89–105.
- Stern, N. (1995) The 'Blue' Tuff locality at Koobi Fora in Northern Kenya: archaeological time and the record of past human behaviour. *The Artefact* 18: 49–59.
- Stern, N., Porch, N. and McDougall, I. (2002) FxJj43: a window into a 1.5-million-year-old palaeolandscapes in the Okote Member of the Koobi Fora Formation, Northern Kenya. *Geoarchaeology* 17(4): 349–92.
- Sullivan, A. P. (1978) Inference and evidence in archaeology: a discussion of the conceptual problems. *Advances in Archaeological Method and Theory* 1: 183–222.
- Sullivan, A. P. (1992) The role of theory in solving enduring archaeological problems. In L. Wandsnider (ed.) *Quandaries and Quests: Visions of Archaeology's Future* (Center for Archaeological Investigations, Occasional Paper 20): 239–53. Carbondale, IL, Center for Archaeological Investigations, Southern Illinois University at Carbondale.
- Sutton, S. B. (1994) Settlement patterns, settlement perceptions: rethinking the Greek village. In P. N. Kardulias (ed.) *Beyond the Site: Regional Studies in the Aegean Area*: 313–37. Lanham, University Press of America.
- Taylor, C. C. (1972) The study of settlement pattern in pre-Saxon Britain. In P. J. Ucko, R. Tringham and G. W. Dimbleby (eds.) *Man, Settlement and Urbanism*: 109–114. London, Duckworth.
- Taylor, J. (2000) Cultural depositional processes and post-depositional problems. In R. Francovich, H. Patterson and G. Barker (eds.) *Extracting Meaning from Ploughsoil Assemblages*: 16–26. Oxford, Oxbow Books.
- Tilley, C. (1994) *A Phenomenology of Landscape: Places, Paths, and Monuments*. Oxford, Berg.
- Trigger, B. G. (1967) Settlement archaeology – its goals and promise. *American Antiquity* 32: 149–160.
- Trigger, B. G. (1989) *A History of Archaeological Thought*. Cambridge, Cambridge University Press.
- Trigger, B. G. (1995) Expanding middle-range theory. *Antiquity* 69: 449–58.
- van Andel, Tj. H. and Runnels, C. N. (1987) *Beyond the Acropolis: A Rural Greek Past*. Stanford, Stanford University Press.
- Wandsnider, L. and Holdaway, S. (2003) The problem with palimpsests. Paper submitted to *American Antiquity*.
- Wandsnider, L. (forthcoming) Artifact, landscape and temporality in eastern Mediterranean archaeological landscape studies. In E. Athanassopoulos and L. Wandsnider (eds.) *Mediterranean Archaeological Landscapes: Current Issues*. (Under review.)
- Wells, L. E. (2001) A geomorphological approach to reconstructing settlement patterns based on surficial artifact distribution: replacing humans on the landscape. In P. Goldberg, V. T. Holliday and C. R. Ferring (eds.) *Earth Sciences and Archaeology*: 107–141. New York, Kluwer Academic/Plenum.
- Wells, P. S. (1999) *The Barbarians Speak: How the Conquered Peoples Shaped the Roman Empire*. Princeton, Princeton University Press.
- Whitelaw, T. (2001) Settlement instability and landscape degradation in the southern Aegean in the third millennium BC. In P. Halstead and C. Frederick (eds.) *Landscape and Land Use in Postglacial Greece*: 135–61. Sheffield, Sheffield Academic Press.
- Wilkinson, T. J. (2000) Regional approaches to Mesopotamian archaeology: the contribution of archaeological surveys. *Journal of Archaeological Research* 8: 219–67.
- Wiley, G. R. (1953) *Prehistoric Settlement Patterns in the Virú Valley, Peru*. Washington D.C., Bureau of American Ethnology.
- Wiley, G. R. (1968) Settlement archaeology: an appraisal. In K. C. Chang (ed.) *Settlement Archaeology*: 208–226. Palo Alto, CA, National Press.
- Wobst, H. M. (1978) The archaeo-ethnology of hunter-gatherers, or the tyranny of the ethnographic record in archaeology. *American Antiquity* 43: 303–309.
- Wright, J. C., Cherry, J. F., Davis, J. L., Mantzourani, E., Sutton, S. B. and Sutton, R. F., Jr. (1990) The Nemea Valley Archaeological Project: a preliminary report. *Hesperia* 59: 579–659.
- Wylie, A. (1982) An analogy by any other name is just as analogical: a commentary on the Gould-Watson dialogue. *Journal of Anthropological Archaeology* 1: 382–401.
- Wylie, A. (1989a) Archaeological cables and tacking: the implications of practice for Bernstein's 'Options beyond objectivism and relativism'. *Philosophy of the Social Sciences* 19: 1–18.
- Wylie, A. (1989b) The interpretive dilemma. In V. Pinsky and A. Wylie (eds.) *Critical Traditions in Contemporary Archaeology*: 18–27. Cambridge, Cambridge University Press.
- Wylie, A. (1995) An expanded Behavioral Archaeology. In J. M. Skibo, W. H. Walker and A. E. Nielsen (eds.) *Expanding Archaeology*: 198–209. Salt Lake City, University of Utah Press.