

6. A Quest for Antecedents: A Comparison of the Terminal Middle Palaeolithic and Early Upper Palaeolithic of the Levant

Gilbert B. Tostevin

Introduction

The significance of the Upper Palaeolithic is one of the most intriguing questions for Palaeolithic researchers. Due to the Levant's strategic location at a bottleneck between continents (*sensu* Sherratt 1996), a search for the geographic origins of the Levantine Upper Palaeolithic can play a more central role in determining the meaning and significance of the Upper Palaeolithic as a whole than in other regions (Fig. 6.1). Yet the importance of this research topic does not make it easier to address current methodological problems. Specifically, research on the origins of the Levantine Upper Palaeolithic has been hampered by methodological conflicts over how to characterize technological variability within and between assemblages. As the current approaches to characterizing intra-assemblage variability are unsuitable for determining degrees of difference and similarity between assemblages, not to mention identifying antecedents for Upper Palaeolithic flint knapping behaviour, these issues must be resolved before the importance of the Levant's role can be appreciated. This paper advances an analytical structure whereby the characterization of intra-assemblage variability across the Middle to Upper Palaeolithic transition aids, rather than detracts from, evaluations of inter-assemblage variability. An example of the comparison of one of the last Middle Palaeolithic assemblages in the Levant, Kebara Cave Unit VI, and the earliest Transitional or Upper Palaeolithic assemblage, Boker Tachtit Level 1, is used to place these methodological considerations in perspective.

A Quest for Antecedents

In discussing the origins of material culture innovations, anthropologists and historians of science frequently use the presence of antecedents to identify the region of origin of an innovation. As Barnett states, '...any innovation is made up of pre-existing components... No innovation springs full-blown out of nothing; it must have antecedents...' (1953:181). This principle is corroborated by social anthropology (Kluckhohn 1936; Kroeber 1940),

history of science (Needham 1954; Basalla 1988:49, 55), and archaeological theory (Ford 1952:330; Deetz and Dethlefsen 1965; Dethlefsen and Deetz 1965; Willey *et al.* 1956:7; Renfrew 1978; Andrefsky 1987:19). Given the recognition by many disciplines that innovations take advantage of multiple, pre-existing elements in the construction of novel material culture, prehistorians are not alone in using the antecedent principle to source innovations in time and space. The antecedent principle has recently been applied to both Harrold's (1989) and Hovers' (1998) treatment of the Middle to Upper Palaeolithic transition in western Europe and the Levant, respectively. Despite its use in this context, however, the analysis of potential antecedents to the Upper Palaeolithic has been hampered by two serious problems.

First, there has been little connection between the analysis of the archaeological pattern of potential antecedents through time and space and a suitable body of anthropological theory that would explain the significance of the pattern. Tostevin (2000a, b) proposes one body of theory designed to distinguish archaeological examples of intra-regional innovation from inter-regional diffusion in an effort to fill this methodological gap. With this body of theory, it is possible to assess the goodness of fit between the archaeological record and model expectations, which predict how the record should appear given an *in situ* origin or an external origin for the Upper Palaeolithic.

The second problem, however, is potentially more difficult to resolve. There is as yet no consensus among lithic analysts on what constitutes an 'antecedent' or 'pre-existing component' for the lithic material culture of the Upper Palaeolithic. Is an antecedent in an assemblage the presence of one blade, many blades, a few Upper Palaeolithic retouch types, many Upper Palaeolithic retouch types, one prismatic core, or many prismatic cores? If all of these units are to be analysed as potential antecedents, how is each to be weighted in its importance to the question of the *in situ* origin of the Upper Palaeolithic in a particular region? These are fundamental questions, since an evaluation of whether or not a particular geographical region witnessed an *in situ* evolution of the

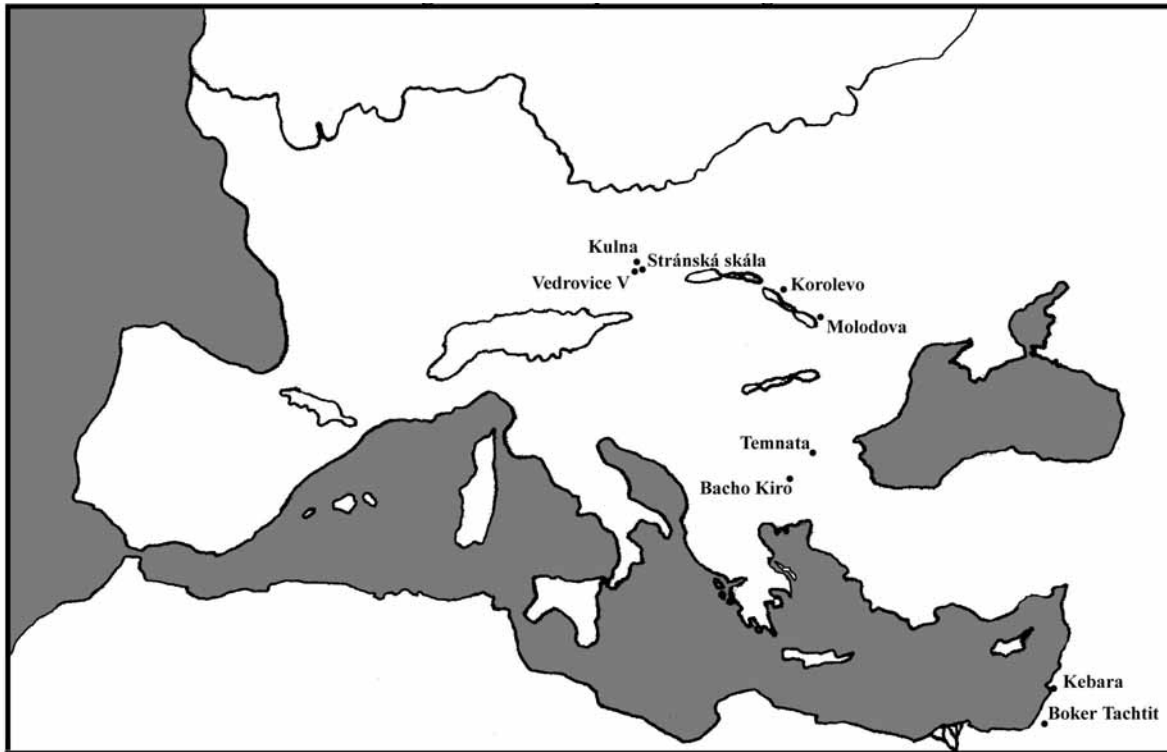


Fig. 6.1 Map showing location of assemblages used in the present study.

Upper Palaeolithic requires a quantitative assessment of the number of antecedents present. For, as noted by Tylor (1896), Steward (1929), and Andrefsky (1987), the more antecedents present in a region, the greater the probability that the evolution occurred *in situ* in that region. Thus, in looking for antecedents to Upper Palaeolithic behaviour, we must structure our units of analysis to facilitate the final, *quantitative* evaluation of those units to answer our question. Unfortunately, little concern has so far been devoted to this necessity.

Individual Precocious Artefacts as Antecedents

Consider the potential role of individual artefacts as antecedents. One prismatic blade core found in the context of a Late Middle Palaeolithic assemblage may be considered 'precocious' in nature if the assemblage is composed almost exclusively of flakes. The prismatic blade core may thus be thought of as an 'antecedent' to the dominant use of blades in the subsequent Upper Palaeolithic. The same argument holds for the appearance of one blade in a similar context. In Vishnyatsky's terminology, the blade or core would represent a 'running ahead of time' (1994:135). Despite the apparent logic of this type of argument, there are many reasons to avoid using anecdotal examples of single artefacts as antecedents.

First, individual precocious artefacts frequently appear

in stratigraphic units of earlier periods for a plethora of reasons unrelated to the continuity of population-specific, learned traditions. Unfortunately, post-depositional alteration of artefact associations gives credence to the observation that the fewer the artefacts used to infer prehistoric behaviour, the more likely it is that the inference is based on intrusive pieces (see Courty *et al.* 1989; Goldberg *et al.* 1993; Karkanas *et al.* 2000). Thus, the very nature of deposits containing Palaeolithic artefacts makes it unwise to consider the presence of one or a few individual artefacts as evidence of behaviours representative of an entire assemblage.

Second, single or rare examples of an artefact type are more misleading than cumulative characterizations of variability. The principle of equifinality among many lithic operational sequences should render suspect the identification of a reduction strategy on the basis of a single precocious artefact. A single artefact, for instance, may represent '... the individual variability among flint knappers who were members of the same group; situations when expediency needs ruled over systematic core reduction; a short period (season?) of raw material shortage; training children as future artisans by using cores or thick flakes that adult knappers would consider to be unusable' (Bar-Yosef 1998b:44). An over-emphasis on intra-assemblage variability based on a few artefacts which are unrepresentative of the rest of the assemblage risks

treating idiosyncratic variation as antecedents, despite the lack of a relationship between the variation and the learned behaviours which constitute material culture traditions.

Third, even those individual artefacts that can be considered diagnostic of a particular operational sequence are problematic for use in an analysis of antecedents since such piece-by-piece representations often produce the same list of reduction strategies for many assemblages. For instance, in a survey of Levantine Mousterian intra-assemblage variability, Goren-Inbar and Belfer-Cohen (1998) point out that every assemblage contains some evidence of each of the Levallois reduction sequences known in the Levant. This intra-assemblage variability is present throughout the Levantine Mousterian despite the fact that each type of reduction sequence formed the dominant portion of the debitage during a different chronological period (Bar-Yosef 1998b; see Goren-Inbar and Belfer-Cohen 1998 for critiques of this scheme). The Tabun-type sequence demonstrates that if assemblage characterization is based on its constituent reduction strategies *without considering how representative they are of the whole*, one will always recognize the same list of reduction strategies despite major techno-chronological trends. If taken to an extreme, every lithic variable could be represented by an 'antecedent' in every period of prehistory.

While not entirely immune to the above problems, a quantified approach to characterizing intra-assemblage variability avoids, or at least lessens, problems with piece-by-piece characterizations of lithic assemblages. For instance, by using central tendency statistics to identify which knapping behaviours are representative of a lithic operational sequence, it is possible to recognize the anthropological significance of the presence of one blade core in a late Middle Palaeolithic context *versus* the presence of several or many blade cores. This is the scale at which analysts should search for antecedent lithic behaviours.

One final problem with the use of single, precocious artefacts as indicators of antecedents needs to be addressed. Even if post-depositional concerns and the equifinality of reduction strategies can be put aside, what does the fact that one prismatic blade core was made by a Late Middle Palaeolithic hominid tell the lithic analyst? Anthropologically, the fact means little, since the existence of that core does not signify that anyone but its knapper had the technical knowledge, *i.e.* the *connaissance* and *savoir-faire*, to produce that object. As Hovers (1998) points out in an excellent discussion of Renfrew's innovation theory (1978), an invention becomes an innovation only when the majority of the group adopts it. A single new artefact form represents only an invention that failed as an innovation. The technical knowledge represented by that one artefact, perhaps because it was not compatible with the social milieu of the majority of the group's population, died with the knapper. The implications of this point will be discussed later in this paper.

Antecedents in Anthropological Theory

Anthropological theory that distinguishes instances of independent innovation from inter-regional diffusion (Tostevin 2000a, b) relies upon the principle of 'technological style'; material culture traditions can be described based on the variation in how artefacts are made (Kroeber 1940; Lechtman 1977; Hughes 1987; Pinch and Bijker 1987; Lemonnier 1986, 1992). Ethnoarchaeology and archaeology demonstrate co-variance of technological variability with population groups that share other learned traditions (Lechtman 1977; Hodder 1979; Longacre 1981; Braithwaite 1982; Wiessner 1990; Childs 1991; Aronson *et al.* 1994; Stark 1995). This makes the principle of technological style appropriate for identifying changes in the learned traditions of different populations through time. Thus, by quantitatively measuring the degree of similarity or dissimilarity between the technological styles of assemblages through time in one region, it is possible to characterize the continuity or discontinuity of the learned traditions in that region. This is the process by which antecedents are recognized between assemblages and counted to characterize inter-assemblage continuity. Parsimony, the concept that the simplest explanation is the most probable, can then be used to distinguish a diffusion event from an independent innovation event by testing the goodness of fit between the actual degree of continuity/discontinuity within a region through time and the expected continuity/discontinuity for each type of event.

When applying the technological style concept to the material culture of the Upper Palaeolithic, the lithic operational sequence becomes the characterization of the technological style for each assemblage. An inter-assemblage comparison of operational sequence variability then becomes the measure of similarity/dissimilarity between assemblages through time. The description of this inter-assemblage variability must therefore include comparable units between assemblages. The comparability of these units is difficult to achieve, however, given the research trajectories which separated characterization of 'Middle Palaeolithic' technological variability from that of 'Upper Palaeolithic' assemblages (see White 1982:169; Harrold 1978, 1989).

For example, during most of the twentieth century, the Upper Palaeolithic was defined against the Middle Palaeolithic based on a blade/flake dichotomy, allowing little evaluation of degrees of similarity between assemblages; an assemblage was either flake-based or blade-based. Unfortunately, the use of the *index laminaire* as a relative scale between flake and blade dominance has not resolved the problem, since the lack of an exclusive correlation between blades and the Upper Palaeolithic makes the dichotomy artificial (Conard 1990; Révillion and Tuffreau 1994; Vishnyatsky 1994; Meignen 1994). Thus blades *per se* cannot be considered as antecedents to the Upper Palaeolithic.

Fortunately, since not all blanks with lengths twice their widths are the same, the concept of 'blade tech-

nology' as an antecedent can be divided into appropriate units of analysis. A specific blade technology production sequence or *chaîne opératoire* may differ in many details from another that also produces blades (Tixier 1984; Pelegrin 1990a; Meignen 1998). Yet how are the two blade operational sequences to be characterized? Frequently, lithic technologists following the French school define each *chaîne opératoire* type by its 'desired end products' and 'diagnostic' debitage (Boëda *et al.* 1990). If an assemblage contains specific elements of a particular *chaîne opératoire*, that assemblage must fall within that type. If it lacks these elements, it falls within another, frequently its own unique *chaîne*. Yet no quantitative assessment is possible between types such as *Levallois récurrent unipolaire* and *Levallois préférentiel centripète*. Because analytical units defining each *chaîne* are unique, this characterization method produces a typology of technological types similarly unsuitable for evaluating degrees of similarity/dissimilarity as the blade/flake dichotomy.

A point must be made concerning the use of typologies. The above criticism of the *chaîne opératoire* approach does not constitute a total condemnation of this typological system. It must be recognized explicitly to be a typological system, however, just as is Bordes' (1961a) tool typology. Both systems partition lithic variability into units or types for a particular function. As Adams and Adams (1991) note, every typological framework has particular functions and does not represent the end-all of possible analyses. A typology is just *one* way of dividing up variability for the purposes of a particular question. This point is frequently forgotten. Multiple typologies of lithic variability may, and perhaps should, be used concurrently to address multiple research topics (Andrefsky 2000). In searching for antecedents to the Upper Palaeolithic in the Middle Palaeolithic, the relevant anthropological theory requires an analytical system to structure description of intra-assemblage variability so as to facilitate comparison of inter-assemblage variability. The *chaîne opératoire* typological system is well suited to other research questions but, unfortunately, is not suitable for the task at hand.

What is needed to make the *chaîne opératoire* system more suitable to our needs is to define analytical units of categorical variables within each operational sequence that are comparable across assemblages. Assemblages must be recognized to consist of individual behavioural components that vary between (and within) assemblages through time and space. Yet definition and recognition of multiple components within an assemblage can be difficult. For instance, to what degree can a lithic analyst credit different reduction strategies as responsible for the debitage within a given assemblage? It is always possible to demonstrate that an assemblage contains debitage or cores of particular percentages with different dorsal scar patterns, say 60% unidirectional, 10% bi-directional, and 30% centripetal. But when can an analyst demonstrate

that this pattern is a consequence of a dominant unidirectional strategy used on some cores and a subordinate centripetal strategy used on others? Unless different raw material types co-vary with technological attributes associated with different reduction strategies, a serious problem arises. How does one distinguish within an assemblage between two operational sequences which produce their own unique products (#1 producing products A, B, and C, while #2 produces D, E, and F) and one operational sequence which produces all of the products (#3 producing A, B, C, D, E, and F)? Refitting could resolve this problem, but the applicability of refitting is notoriously unevenly distributed in the archaeological record, making it a valued but inconsistent tool for comparisons of assemblages through time.

The striking disagreement between Boëda's (1988a) *lecture* of the knapping technology of the French Middle Palaeolithic assemblage of Biache Saint-Vaast, Level IIA, and Dibble's (1995a) technological attribute analysis of the same assemblage demonstrates the problem of the reliability of inferring multiple operational sequences within the same assemblage. Basing his conclusions upon an examination of the cores and debitage, Boëda inferred that three reduction systems were present: a unidirectional *recurrent* Levallois strategy (Schema A), a bi-directional *recurrent* Levallois strategy (Schema B), and a non-Levallois element. Boëda concluded that the two Levallois schemas were independently executed, *i.e.* each core was reduced unidirectionally or bi-directionally but never both. Dibble analysed the same debitage and demonstrated strong correlations between debitage length and the dorsal scar directions on the debitage. Longer debitage blanks are represented by a higher percentage of unidirectional dorsal scar patterns while shorter blanks are represented by a higher percentage of bi-directional, sub-radial, and radial scar patterns. A similar correlation was found between the amount of cortex on debitage blanks and dorsal scar pattern. As debitage blank length and percentage of cortex decrease as core reduction progresses, Dibble's attribute analysis demonstrated significant evidence for a relationship between Boëda's two schemas and the stage of reduction of the cores. In contrast to Boëda's claims for the schemas' independence, the most parsimonious explanation of Dibble's analysis is that cores were reduced at the beginning of their use-lives by a unidirectional strategy (Schema A) but later on this was replaced by a bi-directional strategy (Schema B).

Antecedents as Cumulative Behaviours Within the Operational Sequence

The Boëda-Dibble example is nevertheless instructive. While the *chaîne opératoire* approach alone has methodological problems, a combination of the strength of attribute analysis with the practice of dividing the operational sequence into a series of behavioural steps has great promise. Frequently, attribute analysis character-

izes the sum of an assemblage's technology rather than identifying the step-by-step knapping behaviours (Movius *et al.* 1968; Newcomer 1971; Collins 1975; Kozłowski and Ginter 1982; Sullivan and Rosen 1987; Johnson and Morrow 1987; Ahler 1989; Henry 1989b; Henry and Odell 1989). The American and French systems can productively be combined, since the theoretical basis behind the French technological school (Mauss 1936; Leroi-Gourhan 1943, 1945, 1964; Haudricourt 1987; Lemonnier 1986, 1989, 1992, 1993) agrees with the American 'technological style' approach to material culture variability. Both theoretical perspectives agree that different material culture traditions exploit different options within the manufacturing process for any given object. These options comprise the manufacturing behaviours observed, learned, taught, and disseminated among the group members. It is recognition of the anthropological significance of this step-by-step variability, combined with the use of attribute analysis to identify the variant used within each step, which provides the best analytical structure to search for antecedents to the Upper Palaeolithic.

The *chaîne opératoire* school frequently divides knapping into the following behavioural categories: raw material procurement, creation of striking platform(s), optional decortication, initial blank production, re-preparation of platform and debitage surfaces, late blank production, blank selection for tools, application of retouch, resharpening of tools, and discard of exhausted pieces. These categories can further be refined through experimental archaeology. Controlled experiments on flake fracture mechanics have demonstrated that a knapper controls a number of independent operational steps during the process of making stone tools (Speth 1972, 1974, 1975, 1981; Bonnichsen 1977; Dibble and Whittaker 1981; Cotterell *et al.* 1985; Dibble and Pelcin 1995; Pelcin 1996). Specifically, knapping steps related to platform treatment, dorsal ridge morphology, and subsequent placement of retouch are all functionally independent and together determine the morphology of each flake and tool (Pelcin 1996). The independence on a flake-by-flake basis of knapping behaviours enables division of the operational sequence into roughly independent behavioural domains:

1. core modification
2. platform maintenance
3. direction of core exploitation
4. dorsal surface convexity system
5. tool manufacture

Within each domain, several behavioural steps are present, each with its own set of equivalent options (*sensu* Sackett 1990:33). By compiling the analytical comparisons, tests, and attribute analyses according to the knapping behaviours for each step within the five independent knapping domains, a system is created to enable rigorous identification of specific knapping behaviours within each domain used to create a particular

assemblage (Baumler 1988; Bergman 1987; Bordes 1961a; Crew 1975; Dibble 1995a; Dibble and Whittaker 1981; Géneste 1985; Henry 1989b; Hours 1974; Kuhn 1990, 1995; Meignen 1994, pers. comm.; Movius *et al.* 1968; Ohnuma 1986; Pelcin 1996; Speth 1981; Van Peer 1992, 1998; Volkman 1989). Most analyses are univariate tests and comparisons of pairs of flake and core attributes, using the principles of dimensional change during reduction (Holmes 1919; Frison 1968; Newcomer 1971; Collins 1975; Jelinek 1976; Stahle and Dunn 1982; Henry 1989b; Dibble 1987) and cortical change during reduction (Sullivan and Rosen 1985; Géneste 1985; Mauldin and Amick 1989; Baumler 1988; Ahler 1989; Dibble 1995a).

Table 6.1 summarizes the behavioural steps within the five knapping domains (and see Tostevin 2000b). The knapping steps within each domain are outlined as well as the specific analytical description to identify which option was used for each step. As noted earlier, the variability within each step requires quantitative characterization since almost every knapping option is used, if only to a small extent, in any given assemblage. Thus, these descriptions characterize the cumulative behaviours used by the knappers for each step of the process. The continuous variables frequently measure the central tendency of the variability within the particular knapping step. For discontinuous or categorical variables, the use of each option is quantified in order to gauge how representative it is of the behaviours used within that step as a whole. Consequently, the analytical units in this methodology are quantifiable, replicable, and representative of the behaviours used to create an assemblage. As such, this methodology is structured to characterize intra-assemblage variability so as to evaluate regional inter-assemblage variability.

Comparison of the Terminal Middle Palaeolithic and Early Upper Palaeolithic of the Levant

The Temporal Framework

To begin a quest for antecedents to the Upper Palaeolithic within the Middle Palaeolithic of the Levant, it is necessary first to address the temporal framework in which to look for antecedents. The antecedent principle states that the probability that a new material culture was developed *in situ* in a region is directly proportional to the number of antecedents already present in that region and inversely proportional to the number of innovations that are needed to make the new material culture out of the old. Great importance is thus placed on the number of acts of innovation in evaluating the probability of an *in situ* development. As with Renfrew's (1978) distinction between invention of an artefact and its adoption as an innovation, one must examine the continuity of the use of each innovation in order to evaluate the number of innovations within a block of time.

Table 6.1 Analytical Description of the Knapping Process.

Behavioural Domain	Knapping Step	Analytical Description
Core Modification	Core Orientation: Orientation of the raw material as a core: longitudinal vs. broad.	Core refits & extant core morphologies.
	Core Management: Strategic removals to rejuvenate surface convexities.	Core refits, extant core morphologies, <i>débordant</i> & crested debitage.
Platform Maintenance	Platform Treatment: Reparation of platform surfaces: core tablet, faceting, <i>etc.</i>	Platform type for tools and debitage.
	External Platform Angle: Tendency to use particular angles between debitage & platform surfaces.	Continuous variable.
	Platform Thickness: Tendency to place the point of percussion at a particular depth relative to platform edge.	Continuous variable.
Direction of Core Exploitation	Direction of Cortex Removal: Directionality of removal of cortical debitage, in both early and late reduction.	Correlation of percentage cortex with dorsal scar patterns on debitage & tools.
	Direction of Blank Removal: Directionality of removal of non-cortical debitage, in both early and late reduction.	Correlations of blank length with dorsal scar patterns on debitage & tools.
Dorsal Surface Convexity System	Longitudinal Convexity: Tendency to use longitudinal ridge systems (for blade products) vs. dispersed ridge systems (for flake products)	Length/Width ratio for tools and debitage.
	Shape of Convexity: Tendency to strike along parallel, convergent, expanding, or diffuse ridge systems.	Lateral edge type for tools and debitage.
	Curvature of Convexity: Tendency to utilize flat, curved, or twisted longitudinal core surfaces.	Profile type for tools and debitage.
	Lateral Convexity: Tendency to utilize one vs. two or more ridges as <i>nervures guides</i> .	Cross-section type of tools and debitage
	Vertical Convexity: Tendency to utilize greater or lesser vertical convexities per removal, quantifying the volumetric conception (<i>sensu</i> Boëda 1994) within an assemblage.	Width/Thickness ratio for tools and debitage.
Tool Manufacture	Selection of Blank attributes for Tools: Fourteen different blank attributes may be used as criteria for selecting pieces to be retouched as tools.	Statistical test (G^2 likelihood ratio) of deviation between tool and debitage sample for 14 given attributes.
	Unique Retouch Types: Tendency to use idiosyncratic types of retouch: carinate, bifacial, <i>etc.</i>	Presence/absence of specific retouch types.
	Tool Types: Tendency to place retouch on distal margins (UP) or lateral margins (MP) of blanks.	Tool kit dominated by MP or UP tool types, using a combination of Bordes' (1961a) and Hours' (1974) typologies.

An archaeological example will help illustrate the importance of continuity for antecedents. In recognizing the volumetric conception of blade technology in the early Middle Palaeolithic industry of Hayonim Cave, Meignen (1998:178) argues that, 'In sum, from the Middle Palaeolithic, when the laminar debitage was already known, through the Upper Palaeolithic, during which time this lithic production is overwhelmingly practiced, we can observe a change in the general trend rather than a real technical innovation.' Meignen is implicitly citing the early Middle Palaeolithic blade examples as antecedents for blade industries in the Upper Palaeolithic to argue that blade technology was not *innovated* at the beginning of the Upper Palaeolithic but at the beginning of the Middle Palaeolithic. However, because neither the

hominids of the middle nor late Middle Palaeolithic in the Levant continued the practice of making these same blade technologies, it is impossible to claim that the hominids of the early Upper Palaeolithic in the Levant would have had knowledge of the specifics of that earlier innovation, 200,000 years before. Oral tradition alone cannot have stored and preserved this technical knowledge. While powerful in the preservation of poetry such as the *Iliad* over several thousand years, oral traditions require constant application and performance of the stored knowledge to preserve the information for any length of time. In addition to the absence of blade technologies in the middle period of the Middle Palaeolithic, the application and performance of the early Middle Palaeolithic blade technologies is not continued in even those few late

Middle Palaeolithic assemblages which have a relatively high laminar index, for instance Tor Faraj (Henry *et al.* 1996) and Amud B1 (Hovers 1998), as these blade technologies are not the same in their production details as those of Hayonim lower level E. Thus, unless the continuous practice of a specific blade production can be traced chronologically between the blade industries of the early Middle Palaeolithic and those of the early Upper Palaeolithic in the Levant, examples such as lower level E of Hayonim Cave (Meignen 1998) or Rosh Ein Mor (Marks 1992) will have little significance as behavioural antecedents to the Upper Palaeolithic.

The importance of the continuity of learned behaviours to the antecedent principle thus requires that antecedents to a specific assemblage must be sought in its *immediate* predecessor on the landscape. Just as it is inappropriate to look for antecedents for the early Upper Palaeolithic in the early Middle Palaeolithic without considering what happened in between, it is similarly inappropriate to look for antecedents for a 47,000 bp assemblage in a 70,000 bp assemblage, when a 48,000 bp assemblage exists for comparison. Whatever behaviours are evident in the 70,000 bp assemblages but which are not present in the 48,000 bp assemblages are thus *not available* as behavioural antecedents in the learned tradition of the hominids who created the 47,000 bp assemblages.

The consequences of this hard rule for chronological comparisons of learned behaviour are many. First, as new sites are excavated or re-dated, the most appropriate choice of assemblages for a pair-wise comparison between the terminal Middle Palaeolithic and the early Upper Palaeolithic in any given region will likely change. Second, the rule has the effect of reducing regional variability in a period of time to the signature of the last assemblage within that period. For the Levant, this has the effect of reducing the regional technological variability known to exist among Tabun B-type Middle Palaeolithic assemblages (Kebara Cave Units X–V, Amud B1, *etc.*) to the technological variability known to exist only within the most recent example of these industries.

This second consequence of the chronological concept has disadvantages and advantages. Of the disadvantages, the most significant is the lumping of assemblages found in different environmental landscapes into one regional pool, from which only one assemblage (and thus only one environment) may be chosen to represent either the last terminal Middle Palaeolithic or the first early Upper Palaeolithic assemblage. This effect tends to confound material culture differences which might be due to differences between the Levantine environments of the Mediterranean zone, the Irano-Turanian steppe, the Saharo-Arabian Desert, *etc.* (Henry 1995a:130–132). As more assemblages are studied with the approach advocated here, it will be possible to eliminate this problem by running pair-wise comparisons for each sub-region and comparing the results. Such a research project would be worthwhile; in the meantime,

however, the best choice for a single pair-wise comparison remains the closest dated assemblages on either side of the Middle to Upper Palaeolithic transition within a broad geographic locality.

Of the advantages, the most important is the fact that the chronological rule avoids the reification of the analytical categories of ‘Middle Palaeolithic’, ‘transitional’, and ‘Upper Palaeolithic,’ by preventing the comparison of ensembles of assemblages combined to represent an analytical unit, such as the Middle or Upper Palaeolithic as a whole. Such characterizations of the transition do not elucidate how or why the transition occurred, just that one did. With the chronological comparison of temporally adjacent assemblages, however, one can study the changes in flint knapping behaviours at each temporal junction between dated assemblages. Multiple transitions may become apparent at this resolution.

Sampling Considerations

For the comparison of the terminal Middle Palaeolithic and early Upper Palaeolithic of the Levant, there are three requirements for selecting appropriate assemblages for study, in addition to the requirement that these assemblages *immediately* succeed each other in time:

1. Because technological studies of debitage are particularly vulnerable to problems with artefact associations, assemblages must have been excavated with rigorous collection and proveniencing methods in order to assure the association of artefacts with a common depositional period in the site. This requirement eliminates many potential assemblages.
2. The assemblages must be associated with adequate radiometric dates as well as geological data to assign them to a specific date between 60–30,000 bp, the period during which the Middle to Upper Palaeolithic transition occurred across Eurasia. While a narrower time period can be used, the larger time block places any transition in the context of the technological variability before and after the event.
3. The assemblages should represent each of the known industrial types within the region during the period in question.

Based on these three factors and the chronological rule above, the assemblage from Kebara Cave, Unit VI was chosen to represent the terminal Middle Palaeolithic in this pair-wise comparison. Although the stratigraphic unit that directly underlies the Upper Palaeolithic deposits at Kebara is Unit V, Unit VI was chosen because of stratigraphic uncertainties differentiating between Unit IV (Upper Palaeolithic), and the Middle Palaeolithic Unit V (Bar-Yosef *et al.* 1996:301). Unit VI yielded an AMS date of >48,000 bp (Gif-TAN-90029) and a TL date of 48,300 ± 3,500 bp (Valladas *et al.* 1987). The assemblage from Amud B1/6, possessing an ESR date range of 43,000 ± 5000 bp (early uptake) to 48,000 ± 6000 (late uptake)

(Schwarcz and Rink 1998), is also a likely candidate (Hovers *et al.* 1995; Hovers 1998). The possible inclusion of this assemblage alongside Kebara VI warrants further study.

To represent the Early Upper Palaeolithic, the assemblage from Boker Tachtit level 1 was chosen. Argued to demonstrate *in situ* development of Upper Palaeolithic blade technology from a Middle Palaeolithic technology (Marks 1990), the absence of a Middle Palaeolithic retouched tool kit has led to suggestions that basal Boker Tachtit represents a fully Upper Palaeolithic occupation (Bar-Yosef 1994; Bar-Yosef *et al.* 1996). This occupation produced several radiocarbon dates, of which $47,280 \pm 9,050$ bp (SMU-580) is the oldest.

The sampling protocols for the assemblages are described below.

KEBARA CAVE, UNIT VI

Kebara Cave is situated at the western edge of Mt. Carmel, overlooking the Mediterranean coastal plain. First excavated by Turville-Petre (1932) and later by Stekelis (Schick and Stekelis 1977), the deposits contain a sequence from the Middle Palaeolithic to the Epipalaeolithic. The sample studied derives from the recent excavations headed by Bar-Yosef and Vandermeersch (1982–1990) (Valladas *et al.* 1987; Bar-Yosef *et al.* 1992; Meignen and Bar-Yosef 1988, 1991; Bar-Yosef *et al.* 1996). This unit is relatively rich in debitage and tools and a sample from 5m² was sufficient for the purposes of the technological study. This choice was influenced by proximity to the western profile of the excavation.

BOKER TACHTIT, LEVEL 1

Boker Tachtit is an open-air site in the central Negev Desert of Israel. Excavated during the Southern Methodist University project in the Avdat/Aqev area in the late 1970s (Marks 1983b; Marks and Volkman 1983), four super-imposed cultural horizons were identified, three of which were extremely rich in artefacts. Extensive refitting was conducted on the material, allowing the vast majority of the lithic operational sequences to be defined with great accuracy (Volkman 1983, 1989).

The published analyses of the refits serve as the substantive support for the following discussion of the Boker Tachtit level 1 operational sequence, since most individual artefacts themselves are currently almost impossible to study due to the refitting. Amongst the unrefitted items a sample of 100 artefacts from five squares was studied with the attribute analysis advocated here in order to produce comparable data for the study.

Comparison of Kebara Unit VI and Boker Tachtit level 1

Table 6.2 compares the operational sequences of the

assemblages from Kebara Unit VI and Boker Tachtit level 1. This presents each knapping step in the sequence by behavioural domain and characterizes the cumulative behaviours used for each step of the sequence in the production of the two assemblages. Judgement of the significance of any difference between the assemblages' choice of option for each step in the operational sequence is also indicated. Thus, steps related to data taken from cores or refits are often qualitative, while steps related to data from flakes and tools are mostly quantitative. Unidentifiable variable states, such as crushed platforms, unreadable exterior platform angles, *etc.*, were not included in the calculation of descriptive statistics used in this table. A 'p' value indicates the probability that the data obtained from the two assemblages were randomly derived samples from the same population (*i.e.*, with the assumption that they were produced by the same cumulative behaviours). A significance level of 5% is used here for all statistical tests, including student's t-test or G² likelihood ratio (approximating the *chi*-square distribution) (Sokal and Rohlf 1995).

If one instance of agreement exists between the two assemblages for a given knapping option used in a given behavioural step, then it is possible to argue that the earlier assemblage possesses an antecedent for the behaviour in that step in the later assemblage. It is thus possible to search for and count antecedents for Boker Tachtit 1 within Kebara VI on a step-by-step behavioural basis. Evaluation of the goodness of fit between the archaeological record and the continuity/discontinuity of behaviours expected given a diffusion event *versus* an independent innovation event can proceed based on this step-by-step counting of antecedents (see Tostevin 2000a for a discussion of the models and test expectations).

Any antecedents can also be treated quantitatively to evaluate the competing hypotheses. However, to produce a quantitative measure of the difference (or similarity) between assemblages, one cannot simply sum up the number of operational steps in which a significant difference exists between the two options, as this would bias the results through the interdependence of the units. Specifically, while flake fracture mechanics experiments show that knapping options are functionally independent *between* the five knapping domains, the possibility remains that options *within* each domain may affect subsequent options during core reduction, as experiments have not tried to control for this issue. It is thus necessary to avoid counting the same units twice, a situation known in statistics as Galton's Problem (Tylor 1889 in Moore 1961; Thomas 1986:448). In order to quantify pair-wise assemblage comparisons, therefore, the knapping steps in which significantly different options were used between assemblages are first summed *within* their specific knapping domain and divided by the total number of steps within that domain. The resulting numerical values of all five domains are then summed up to produce a measure ranging from 0 (for assemblages with identical operational

Table 6.2 Comparison of the Operational Sequences of Kebara Unit VI and Boker Tachtit Level 1.

FLINT KNAPPING STEPS BY DOMAIN	Kebara VI	Boker Tachtit 1	Significant Difference?
CORE MODIFICATION			
Core Orientation	Broad, flat orientation	Longitudinal	Yes
Core Management	<i>Débordant</i>	<i>Débordant</i> & frontal crest	Yes
<i>Number of Differences/2 Steps</i>			2/2=1
PLATFORM MAINTENANCE			
Platform Treatment	Unprepared: 50% Prepared: 50% n=504	Unprepared: 61% Prepared: 39% n=79	No p=.07
External Platform Angle (degrees)	mean: 87.4, s.d.: 16.1, n=474	mean: 88.4, s.d.: 13.6, n=63	No, p=.63
Platform Thickness	mean: 4.78, s.d.: 2.48, n=475	mean: 4.04, s.d.: 2.16, n=65	Yes, p=.02
<i>Number of Differences/3 Steps</i>			1/3=0.33
DIRECTION OF CORE EXPLOITATION			
Direction of Cortex Removal	Unidirectional changing to Sub-centripetal	Unidirectional	Yes
Direction of Blank Removal	Unidirectional & Bi-directional	Bi-directional changing to Unidirectional	Yes
<i>Number of Differences/2 Steps</i>			2/2=1
DORSAL SURFACE CONVEXITY SYSTEM			
Longitudinal Convexity: Length/Width Ratio	mean: 1.78, n=603 s.d.: 0.82,	mean: 2.25, n=101 s.d.: 1.21,	Yes p=.00
Shape of Convexity: Lateral Edges of Blanks	Parallel: 37% Convergent: 29% Expanding: 23% Ovoid: 11% n=584	Parallel: 71% Convergent: 12% Expanding: 5% Ovoid: 12% n=101	Yes p=.00
Curvature of Convexity: Profile of Blanks	Straight: 68% Curved: 18% Twisted: 14% n=597	Straight: 40% Curved: 40% Twisted: 21% n=101	Yes p=.00
Lateral Convexity: Cross-Section of Blanks	Triangular: 47% Trapezoidal: 36% Other: 17% n=574	Triangular: 55% Trapezoidal: 40% Other: 5% n=101	Yes p=.00
Vertical Convexity: Width/Thickness Ratio	mean: 5.18, s.d.: 2.62, n=603	mean: 4.43, s.d.: 2.33, n=101	Yes, p=.01
<i>Number of Differences/5 Steps</i>			5/5=1
TOOL MANUFACTURE			
Unique Types of Retouch	Normal retouch	Bifacial thinning retouch	Yes
Tool Types	MP tools dominate	UP tools dominate	Yes
<i>Number of Differences/2 Steps</i>			2/2=1
Total Measure of Difference Weighted by Behavioural Domains			4.33

sequences) to 5 (for entirely different operational sequences, *i.e.* without any antecedents). This procedure thus scales the measure of difference according to the variability seen between these five domains.

It must be noted that, although some interdependence has been avoided with the above methodology, this study introduces its own bias in the structuring of pair-wise assemblages' comparisons. Specifically, as the number of steps within each of the five domains differs, the steps in different domains are not weighted evenly. This situation is intentional, in that the number of steps within

a domain reflects the potential for functional constraints to affect the choice of knapping options within that domain. Thus tool manufacture is the most influenced by functional utility and has the largest number (16) of steps within the domain. Direction of core exploitation, on the other hand, has little or no effect on the functional utility of the resulting products and so, suitably, it has only two behavioural steps. This bias in the structure of the pair-wise comparisons should be kept in mind when evaluating the similarity/dissimilarity between assemblages traditionally grouped together based on tool typology alone.

Although both the degree of independence between the five domains and the intentional selection of particular domains as sensitive or insensitive to functional utility will likely generate debate among lithic analysts, it is important to stress that a rigorous and replicable analytical structure is essential for the comparison of lithic assemblages through time and space. Until more experimental studies are conducted in the tradition of Dibble and Pelcin (1995) and Pelcin (1996), contention over relative degrees of independence between knapping behaviours within the analytical structure advocated here is less important than the actual creation and implementation of an analytical structure. Just as the structure of Bordes' typology (1961a) has aided Palaeolithic research while undergoing debate (Bordes 1961b; Binford and Binford 1966; Mellars 1969) and refinement (Debénath and Dibble 1994; Dibble 1995b), it is hoped that the present effort to structure technological comparisons of assemblages will facilitate further research.

The following discussion of the pair-wise comparison between Kebara Cave Unit VI and Boker Tachtit level 1 is based on the procedures advocated above. It does not present the description of the lithic data or the argumentation that led to these interpretations (see Tostevin 2000b).

Core Modification

The first step in the core modification domain, core orientation, represents the initial orientation and shaping of the raw material. This distinguishes between different core forms, based on extant core morphology and evaluation of platform locations during most of core exploitation. In Kebara VI, it is clear from the location of bulbar negatives on the different core surfaces that broad-faced surfaces were chosen exclusively over narrow-aspect surfaces. In the case of Boker Tachtit 1, both Volkman's refittings and personal examination of the location of bulbar negatives on the different core surfaces indicate that most cores were oriented longitudinally to exploit the narrow core surface. Qualitatively different options were used for this step between the two assemblages. Kebara VI thus does not possess the antecedent for this step in the operational sequence.

For the second step in this domain, core management was also different between the assemblages. While the cores and debitage from both Kebara VI and Boker Tachtit 1 use the *débordant* option, the frontal crests to create and maintain dorsal surface convexities in Boker Tachtit 1 represent a significant deviation from Kebara VI.

Platform Maintenance

This domain includes three steps whereby the knapper modifies the platform surface and edge before each removal. In the case of the Kebara VI *versus* Boker Tachtit 1 comparison, only the tendency in the latter assemblage to strike closer to the platform edge, measured by debitage platform thickness, differed significantly. The use in both assemblages of platform faceting and equivalent exterior

platform angles indicates that Kebara VI possesses antecedents for two of the three possible steps within this domain.

Direction of Core Exploitation

The first step in this domain, the direction of cortex removal, shows dissimilar choices by the knappers of these two assemblages. A cross-tabulation of cortex percentage and dorsal scar directions on debitage indicates that Kebara VI was reduced unidirectionally during initial cortex removal but gradually included more sub-centripetal reduction. A similar cross-tabulation of debitage data from Boker Tachtit 1 illustrates a different option: unidirectional removal of cortical pieces with no shift in strategy. The determination of the second step in this domain, the direction of non-cortical blank removal, relies upon a cross-tabulation of blank length with dorsal scar directions. For this step, Kebara VI shows no shift in strategy but continued unidirectional and bi-directional approaches. Cross-tabulation on Boker Tachtit 1, however, illustrates a clear shift from bi-directional reduction at the beginning of core exploitation to unidirectional reduction at the end of the lives of the cores. This interpretation, based on attribute analysis, is corroborated by Volkman's refits (for instance, see Volkman 1989: Figs. 6.7, 6.8, 6.9, 6.13). Neither step within this domain demonstrates the existence of an antecedent behaviour for Boker Tachtit 1 within Kebara VI. It is interesting to note that Kebara VI, while recognized to be a Tabun B-type industry, does not possess a large amount of debitage with unidirectional-convergent scar patterns (only 17.8% compared to 27.1% unidirectional, 19.3% bi-directional, 10.3% crossed, 11.2% sub-centripetal, 4.7% centripetal, 2.5% crested, and 7.2% indeterminate, see Tostevin 2000b: Table 7.6).

Dorsal Surface Convexity System

The dorsal surface convexity domain includes the knapping steps that encapsulate the cumulative tendencies to use particular ridge patterns on the core exterior for the production of blanks. Of the possible five steps all options were statistically different between the two assemblages. The debitage and tools from Boker Tachtit 1 illustrate use of core convexities that are more longitudinal, more parallel sided, more curved in profile, dominated by single ridges, and less Levalloisian (width/thickness ratio of 4.43 compared to 5.18) in its use of vertical convexities than Kebara VI.

Tool Manufacture

For the tool manufacture domain, only retouch type and tool kit composition are comparable between these two assemblages due to the lack of blank selection criteria for Boker Tachtit 1, which was unavailable in published form and from the un-refitted debitage. While Kebara VI has predominantly Middle Palaeolithic tool types (114 tools out of 990 artefact sample) with no bifacial retouch, Boker

Tachtit 1 has the bifacial thinning retouch associated with Emireh points and a dominance of Upper Palaeolithic tool types (Marks 1983b: Table 5.9: Upper Palaeolithic types represent 75.3% of the retouched tools, excluding unretouched pieces and Levallois blank types). This final domain thus produced a measure of difference of 2/2.

Final Measure of Difference

The final measure of difference between the operational sequences of Kebara Unit VI and Boker Tachtit level 1, weighted by the five knapping domains, produces a value of 4.33 out of a possible maximum difference of 5.0. This value is the greatest witnessed in 22 pair-wise comparisons between 18 assemblages dated 60–30,000 bp over three regions (the mean value is 2.34; Tostevin 2000a, b). This value of 4.33 indicates that the operational sequences are in fact extremely dissimilar and that few antecedents for the behaviours that created Boker Tachtit 1 can be found in Kebara VI.

Despite the arguments for an *in situ* technological transition between the Middle and Upper Palaeolithic at Boker Tachtit, the basal assemblage already differs as much as possible from its immediate temporal predecessor on the Levantine landscape, Kebara VI. This indicates that any ‘transition’ was already underway at the time of Boker Tachtit level 1. While Marks (1990, 1992) has argued that the early Middle Palaeolithic Negev site of Rosh Ein Mor is the progenitor of a Tabun D-type lineage culminating in the Boker Tachtit level 1 assemblage, there is currently no chrono-stratigraphic evidence for such continuity (Bar-Yosef 1998b). Demidenko and Usik (1993a) suggested that the ‘bladey’ Levalloisian industries dated to 70,000 bp at Tor Faraj and Tor Sabiha in Jordan (Henry 1992, 1995a, b) may provide this continuity. Yet more fieldwork needs to be conducted in both Israel and Jordan to find a later (*i.e.* 50–47,000 bp) example of similar industries before one can replace Kebara VI as the immediate predecessor to Boker Tachtit level 1 in a comparison such as this.

Conclusions: The Levantine Case Study in a Wider Context

The above comparison of Kebara Cave Unit VI and Boker Tachtit level 1 illustrates how antecedents to the Upper Palaeolithic can be sought within the Middle Palaeolithic in any region. This approach within regional contexts can also be applied *between* regional contexts. A study of knapping behaviours between 60–30,000 bp in three regions of the Old World (the Levant, central Europe, and eastern Europe) was conducted (Tostevin 2000a, b) in order to evaluate the suggestive geographic trend in radiometric dates for the earliest Upper Palaeolithic industries in western Eurasia (Bischoff *et al.* 1989; Cabrera Valdes and Bischoff 1989; Straus 1989, 1994; Kozłowski 1990; Otte and Keeley 1990; Rink *et al.* 1996; Bar-Yosef *et al.* 1996; Mellars 1996a). The findings demonstrate

that the pattern of change in knapping behaviours within the Levant is not exceptional but quite similar to what transpired in both central Europe and eastern Europe. The beginnings of the Levantine Upper Palaeolithic were part of a much larger phenomenon that did not actually originate in that region.

When examining the quantitative dissimilarity (*i.e.*, a count of antecedents) between assemblages through time in each region (Table 6.3; see Tostevin 2000a, b for more details), the Middle Palaeolithic assemblage in each region is succeeded by an assemblage with an extremely different technological style. Whether ‘transitional’ or ‘Upper Palaeolithic,’ these three post-Middle Palaeolithic assemblages are in fact quite similar to *each other*. The pair-wise comparisons between Boker Tachtit level 1 and the Bohunician assemblage of Stranska skala IIIa–4 in central Europe (producing a difference value of 1.93) and between Boker Tachtit level 1 and the first non-Middle Palaeolithic assemblage in eastern Europe, Korolevo II Complex II (producing a value of 1.93), are extremely surprising given their geographical separation. The first comparison is less than twice as different as the value between the Stranska skala Bohunician assemblages themselves (IIIa level 4 and III, producing a value of 0.98) or between the directly stratified Levantine Aurignacian assemblages at Kebara Cave (Units II and I, producing a value of 1.51). Comparison of Boker Tachtit level 2 to Stranska skala IIIa level 4 produces a value (1.40), which is actually closer than the value between the European Aurignacian (Stranska skala IIIa level 3 and IIa level 4) and the Levantine Aurignacian assemblages (Kebara Unit I) (1.81), although Boker Tachtit level 2 shows fewer similarities with Korolevo II Complex II (2.26). These comparisons point to a common behavioural phenomenon appearing after the last Middle Palaeolithic assemblage in each region.

In order to use the antecedent principle to determine whether or not the Upper Palaeolithic appeared as an *in situ* innovation within a region or by diffusion between regions, it is important to investigate the contingency of the knapping behaviours beyond a simple comparison of the measure of difference between assemblages. This is vital, since the summation of assemblage differences condenses all of the variability between assemblages into one value, so that two different assemblages may appear equally similar to a third but not possess similar options between them. This is not the case, however, with the behavioural options employed in the different steps of the operational sequences of Boker Tachtit level 1, Stranska skala IIIa level 4, and Korolevo II Complex II. When examining the specific knapping options used in these three assemblages, their antecedents cannot be found within the details of the Middle Palaeolithic operational sequences in each region (Table 6.4). Further, the same specific options that make these assemblages so different from the preceding Middle Palaeolithic assemblages are in fact common to all three assemblages. Despite the

Table 6.3 Measure of Difference in Knapping Behaviours between Assemblages for the Central Europe, Eastern Europe, and the Levant.

Regional Sequence of Change	Comparison of Assemblages Through Time (Industrial Affiliation, Radiometric Date)	Measure of Difference (Maximum=5, Minimum=0)
Levant	Kebara Cave Unit VI (Levantine Mousterian) <i>versus</i> Boker Tachtit level 1 (transitional)	4.33
Central Europe	Kůlna Cave Layer 7a (Micoquian) <i>versus</i> Stranska skala IIIa-4 (Bohunician)	3.76
Eastern Europe	Molodova V Layer 11 (Middle Palaeolithic) <i>versus</i> Korolevo II-II (transitional)	3.44
Inter-Regional Comparisons	Boker Tachtit level 1 <i>versus</i> Stranska skala IIIa-4	1.93
	Boker Tachtit 1 <i>versus</i> Korolevo II-II	1.93
	Stranska skala IIIa-4 <i>versus</i> Korolevo II-II	2.56
	Boker Tachtit 2 <i>versus</i> Stranska skala IIIa-4	1.40
	Boker Tachtit 2 <i>versus</i> Korolevo II-II	2.26
	Kebara I (Levantine Aurignacian) <i>versus</i> Stranska skala IIIa-3 & Iia-4 (Aurignacian)	1.81

geographical distances separating them, the assemblages of Boker Tachtit level 1, Stranska skala IIIa level 4, and Korolevo II Complex II all possess a specific and unique cluster of knapping options (Table 6.5).

Parsimony favours the conclusion that all three assemblages share the same behavioural package which diffused from one region to another, appearing first in the Levant at 47/46,000 bp, next in central Europe by 42,000 bp, and finally in eastern Europe by 38,000 bp (Tostevin 2000a). The entire operational sequence is not exactly the same in each assemblage but this variance is to be expected in any diffused set of behaviours. For instance, although the differences between Stranska skala IIIa-4 and Korolevo II-II are greater than the differences between these assemblages and Boker Tachtit level 1 (2.56 *versus* 1.93), the behaviours within the diffused package would have continued to deviate through time and space, a process Deetz and Dethlefsen (1965) called the Doppler Effect, as the package proceeded down two paths, one toward central Europe, and one to eastern Europe.

Further research is needed within each region to increase the sample of assemblages representative of the period between 60–30,000 bp. Yet, the current data supports the conclusion that these three assemblages

(Boker Tachtit level 1, Stranska skala IIIa level 4, and Korolevo II Complex II) represent the diffusion of a phenomenon we may call the ‘Bohunician Behavioural Package,’ named after the central European industry marking its northwestern-most distribution (it does not appear to have reached western Europe). This appellation is only fitting given the fact that central and eastern European scholars (Valoch 1990; Kozłowski 1990; Ginter *et al.* 1996; Demidenko and Usik 1993a) were the first to notice morphological similarities among these disparate assemblages. The regional origin of this behavioural package should be sought in adjacent localities, including southeastern Europe, the Nile Valley, and Anatolia.

The ‘Bohunician Behavioural Package’ is the first of two diffusion events evidenced by this research, the second being the ‘Aurignacian Behavioural Package,’ introducing a new distinctive suite of knapping options to the Levant (Kebara Cave Unit II) and central Europe (Stranska skala Iia-4 and IIIa-3) (Tostevin 2000a, b). As with its predecessor, the ‘Aurignacian Behavioural Package’ did not possess sufficient antecedents within any of the three regions studied to warrant an *in situ* appearance in these regions.

Discussion of the consequences of this research for

both the Levantine Middle to Upper Palaeolithic transition as well as the central and eastern European transitions is beyond the scope of this paper. Nevertheless, the example of the comparison of two technological styles at the Middle to Upper Palaeolithic transition in the Levant illustrates how the quest for antecedents can proceed and what fascinating results such an endeavour produces. As

long as antecedents are sought by means of quantitative, cumulative characterizations of the contingent details within the technological styles of immediately successive lithic assemblages, the antecedent principle will light our way to a richer understanding of the origins of the Upper Palaeolithic, in the Levant and elsewhere.

Table 6.4 Operational Sequences for the first Pair-wise Comparisons in Each Region.

The Levant	
Kebara Cave Unit VI	
<i>Core Modification:</i>	Broad-face Orientation; <i>Débordant</i> Core Management
<i>Platform Maintenance:</i>	Prepared Platforms, ~87 degree External Platform Angle, ~5 mm Platform Thickness
<i>Direction of Core Exploitation:</i>	Unidirectional changing to Sub-centripetal Cortex Removal, Independent Unidirectional & Bi-directional Blank Removal
<i>Dorsal Surface Convexity:</i>	Varied Lateral Edges, Straight Profile, Length/Width Ratio of 1.78, Width/Thickness Ratio of 5.18
<i>Tool Manufacture:</i>	Levallois flakes & sidescraper tool kit
Boker Tachtit Level 1	
<i>Core Modification:</i>	Longitudinal Orientation; <i>Débordant</i> & Frontal Crest Core Management
<i>Platform Maintenance:</i>	Plain & Faceted Platforms, ~88 degree External Platform Angle, ~4 mm Platform Thickness
<i>Direction of Core Exploitation:</i>	Unidirectional Cortex Removal, Bi-directional changing to Unidirectional Blank Removal
<i>Dorsal Surface Convexity:</i>	Parallel & Convergent Lateral Edges, Length/Width Ratio of 2.25, Width/Thickness Ratio of 4.43
<i>Tool Manufacture:</i>	Emireh points, Levallois points, endscraper & burin tool kit
Central Europe	
Külna Cave Layer 7a	
<i>Core Modification:</i>	Unifacial Discoidal with secant surfaces; Convexity Management by Centripetal Removals
<i>Platform Maintenance:</i>	Plain & Prepared Platforms, ~84 degree External Platform Angle, ~9 mm Platform Thickness
<i>Direction of Core Exploitation:</i>	Unidirectional changing to Crossed Cortex Removal, Sub-centripetal changing to Unidirectional Blank Removal
<i>Dorsal Surface Convexity:</i>	Parallel & Expanding Lateral Edges, Trapezoidal Cross-section, Length/Width Ratio of 1.44, Width/Thickness Ratio of 2.83
<i>Tool Manufacture:</i>	Bifaces & bifacial sidescraper tool kit
Stranska skala IIIa Layer 4	
<i>Core Modification:</i>	Longitudinal Orientation; <i>Débordant</i> , Frontal Crest, & Side Blade Core Management
<i>Platform Maintenance:</i>	Plain & Faceted Platforms, ~85 degree External Platform Angle, ~5 mm Platform Thickness
<i>Direction of Core Exploitation:</i>	Unidirectional Cortex Removal, Bi-directional changing to Unidirectional Blank Removal
<i>Dorsal Surface Convexity:</i>	Parallel & Convergent Lateral Edges, Length/Width Ratio of 1.71, Width/Thickness Ratio of 3.99
<i>Tool Manufacture:</i>	Levallois points & Upper Palaeolithic endscraper tool kit
Eastern Europe	
Molodova V Level 11	
<i>Core Modification:</i>	Broad-face Orientation; Core Management by <i>Débordant</i> & Centripetal Removals
<i>Platform Maintenance:</i>	Faceted Platforms, ~86 degree External Platform Angle, ~6 mm Platform Thickness
<i>Direction of Core Exploitation:</i>	Centripetal Cortex Removal, Sub-centripetal changing to Centripetal Blank Removal
<i>Dorsal Surface Convexity:</i>	Varied Lateral Edges, Length/Width Ratio of 1.78, Width/Thickness Ratio of 4.94
<i>Tool Manufacture:</i>	Mousterian points & sidescraper tool kit
Korolevo II Complex II	
<i>Core Modification:</i>	Longitudinal Orientation; <i>Débordant</i> & Frontal Crest Core Management
<i>Platform Maintenance:</i>	Plain Platforms, ~90 degree External Platform Angle, ~8 mm Platform Thickness
<i>Direction of Core Exploitation:</i>	Unidirectional Cortex Removal, Bi-directional changing to Unidirectional and Crossed Blank Removal
<i>Dorsal Surface Convexity:</i>	Length/Width Ratio of 1.71, Width/Thickness Ratio of 4.10
<i>Tool Manufacture:</i>	Flatly-retouched Foliate points & Upper Palaeolithic endscraper tool kit

Table 6.5 *Knapping Behaviours Within the 'Bohunician Behavioural Package'.*

<i>Core Modification:</i>	Longitudinal Orientation; <i>Débordant</i> & Crested Blade Core Management
<i>Platform Maintenance:</i>	Plain & Faceted Platforms, ~86 degree External Platform Angle, ~4 mm Platform Thickness
<i>Direction of Core Exploitation:</i>	Unidirectional Cortex Removal, Bi-directional changing to Unidirectional Blank Removal
<i>Dorsal Surface Convexity:</i>	Length/Width Ratio of 1.80, Width/Thickness Ratio of 4.25
<i>Tool Manufacture:</i>	Levallois point & endscraper toolkit
<i>Assemblages:</i>	Boker Tachtit 1 & 2, Stranska skala IIIa-4 & III, Korolevo II-II, possibly Kulychivka lowest complex (Demidenko and Usik 1993b), possibly Temnata Cave Layer VI, Sector TD-II (Ginter <i>et al.</i> 1996), and possibly Korolevo I-2B (Demidenko and Usik 1993a).

Bibliography

- Adams, W. and E. Adams 1991 *Archaeological Typology and Practical Reality*. Cambridge University Press, Cambridge.
- Ahler, S. 1989 Experimental knapping with KRF and mid-continent cherts: overview and applications. In *Experiments in Lithic Technology*, edited by D. Amick and R. Mauldin, pp. 199–234. BAR International Series 528, Oxford.
- Allchin, B. 1966 *The Stone-Tipped Arrow: Late Stone-Age Hunters of the Tropical Old World*. Barnes and Noble, New York.
- Allsworth-Jones, P. 1990 The Szeletian and the stratigraphic succession in central Europe and adjacent areas: main trends, recent results, and problems for resolution. In *The Emergence of Modern Humans: an Archaeological Perspective*, edited by P. Mellars, pp. 160–242. Edinburgh University Press, Edinburgh.
- Almeida, F. 2000 *The Terminal Gravettian of Portuguese Estremadura: Technological Variability of the Lithic Industries*. Unpublished Ph.D. Thesis, Southern Methodist University, Dallas.
- Almogi-Labin, A., B. Luz and J.-C. Duplessy 1986 Quaternary paleoceanography, pteropod preservation and stable-isotope record. *Palaeoceanography, Palaeoclimatology, Palaeoecology* 57:195–211.
- al-Nahar, M. 2000 *The Upper and Epipaleolithic Transition in the Southern Levant: Microlith Typology Versus Typology*. University Microfilms International, Ann Arbor.
- Ambrose, S.H. 1998a Chronology of the later Stone Age and food production in east Africa. *Journal of Archaeological Science* 25:377–392.
- Ambrose, S.H. 1998b Late Pleistocene human population bottlenecks, volcanic winter, and differentiation of modern humans. *Journal of Human Evolution* 34:623–651.
- Andrefsky, W. Jr. 1987 Diffusion and innovation from the perspective of wedge shaped cores in Alaska and Japan. In *The Organization of Technology*, edited by J.K. Johnson and C.A. Morrow, pp.13–44. Westview Press, Boulder.
- Andrefsky, W. Jr. 1998 *Lithics: Macroscopic Approaches to Analysis*. Cambridge University Press, Cambridge.
- Andrefsky, W. Jr. 2000 *Cobble tool, cobble core, or multi-functional rock?* Paper presented at the 65th Annual Meeting of the SAA, Philadelphia, PA.
- Andrews, P. 1990 *Owls, Caves and Fossils*. Natural History Museum Publications, London.
- Aronson, M., J.M. Skibo and M.T. Stark 1994 Production and use technologies in Kalinga pottery. In *Kalinga Ethnoarchaeology: Expanding Archaeological Method and Theory*, edited by W.A. Longacre and J. Skibo, pp. 83–111. Smithsonian Institution Press, Washington, D.C.
- Audouze, F. 1999 New advances in French prehistory. *Antiquity* 73:167–75.
- Ayalon, A., M. Bar-Matthews and E. Sass 1998 Rainfall-recharge relationships within a karstic terrain in the eastern Mediterranean semi-arid region, Israel: $\delta^{18}\text{O}$ and dD characteristics. *Journal of Hydrology* 207:18–31.
- Ayalon, A., M. Bar-Matthews and A. Kaufman 1999 Petrography, Strontium, Barium and Uranium isotope ratios in speleothems as paleoclimatic proxies: Soreq Cave, Israel. *Holocene* 9:175–222.
- Azoury, I. 1986 *Ksar Akil, Lebanon. A Technological and Typological Analysis of the Transitional and Early Upper Palaeolithic Levels of Ksar Akil and Abu Halka*. BAR International Series 289, Oxford.
- Bachdach, J. 1982 *Das Jungpaläolithikum von Jabrud in Syrien*. Unpublished Ph.D. Thesis, University of Köln, Köln.
- Baharav, D. 1983 Observation on the ecology of the mountain gazelle in the Upper Galilee, Israel. *Mammalia* 47:59–69.
- Bahn, P.G. and J. Vertut 1988 *Images of the Ice Age*. Facts on File, New York.
- Bailey, G.N. (editor) 1997 *Klithi: Palaeolithic Settlement and Quaternary Landscapes in Northwest Greece*. McDonald Institute Monographs, Cambridge.
- Bailey, G.N., E. Adam, E. Panagopoulou, C. Perlès and K. Zachos (editors) 1999 *The Palaeolithic Archaeology of Greece and Adjacent Areas*. Proceedings of the ICOPAG Conference, Joannina. British School at Athens Studies, Athens.
- Bamforth, D. 1984 Analysis of chipped stone artifacts. In *Archaeological investigations on the San Antonio Terrace, Vandenberg Air Force Base, California, in connection with M-X facilities construction*. Chambers, Consultants and Planners. Report submitted to U.S. Army Corps of Engineers, Los Angeles District.
- Bankroft, H. 1937 Report on the charcoal fragments. In *The Stone Age of Mount Carmel. Excavations at the Wadi-Mughara, vol. I*, edited by D.A.E Garrod and D.M.A Bate, p. 129. Clarendon Press, Oxford.
- Bard, E., B. Hamelin, R.G. Fairbanks and A. Zindler 1990 Calibration of the 14C timescale over the past 30,000 years using mass spectrometric U-Th ages from Barbados corals. *Nature* 345:405–410.
- Bardon, L. and J. Bouyssonie 1906 Grattoir carené et ses dérivés à la Coumbo del Bouitou, près Brive (Corrèze). *REAP* 16:401–412.
- Bar-El, T. and E. Tchernov 2001 Lagomorph remains at prehistoric sites in Israel and southern Sinai. *Paléorient* 26:93–109.
- Bar-Matthews, M., A. Ayalon and A. Kaufman 1997a Late Quaternary paleoclimate in the eastern Mediterranean region from stable isotope analysis of speleothems at Soreq Cave, Israel. *Quaternary Research* 47:155–168.
- Bar-Matthews, M., A. Ayalon and A. Kaufman 1997b *Paleo-*

- climate evolution in the eastern Mediterranean region during the last 58,000 yr as derived from stable isotopes of speleothems (Soreq Cave, Israel). IAEA-SM-349/17.
- Bar-Matthews, M., A. Ayalon and A. Kaufman 1998 Middle to late Holocene (6500 years period) paleoclimate in the eastern Mediterranean region from stable isotopic composition of speleothems from Soreq Cave, Israel. In *Water, Environment and Society in Times of Climate Change*, edited by A.S. Issar and N. Brown, pp. 203–214. Kluwer/Academic Press, Amsterdam.
- Bar-Matthews, M., A. Ayalon, A. Kaufman and G.J. Wasserburg 1999 The eastern Mediterranean paleoclimate as a reflection of regional events: Soreq Cave, Israel. *Earth and Planetary Science Letters* 166:85–95.
- Bar-Matthews, M., A. Ayalon and A. Kaufman 2000a Timing and hydrological conditions of sapropel events in the eastern Mediterranean, as evident from speleothems, Soreq Cave, Israel. *Chemical Geology* 169:145–156.
- Bar-Matthews, M., A. Ayalon, A. Matthews and A. Frumkin 2000b *Eastern Mediterranean paleoclimate during the last 250,000 years as derived from the petrography, mineralogy, trace element and isotopic composition of cave deposits (speleothems), Israel*. Israel Geological Survey Report TR-GSI/10/2000.
- Bar-Matthews, M., A. Ayalon, A. Matthews, E. Sass and L. Halicz 1996 Carbon and oxygen isotope study of the active water-carbonate system in a karstic Mediterranean cave: implications for paleoclimate research in semiarid regions. *Geochimica et Cosmochimica Acta* 60:337–347.
- Bar-Matthews, M., A. Matthews and A. Ayalon 1991 Environmental controls of speleothem mineralogy in a karstic dolomitic terrain (Soreq Cave, Israel). *Journal of Geology* 99:189–207.
- Barnett, H.G. 1953 *Innovation: The Basis of Cultural Change*. McGraw-Hill, New York.
- Barnola, J.M., D. Raynaud, Y.S. Korotkevich and C. Lorius 1987 Vostok ice core provides 160,000-year record of atmospheric CO₂. *Nature* 329:408–412.
- Bar-Oz, G. 1996 *The Fauna of the Geometric Kebaran Site, Neve David: Taphonomic, Economic and Ecological Implications*. Unpublished MSc. Thesis, Tel-Aviv University, Tel Aviv.
- Barton, M. and M.P. Neeley 1996 Phantom cultures of the Levantine Epipaleolithic. *Antiquity* 70:139–147.
- Bartov, Y., M. Stein, Y. Enzel, A. Agnon and Z. Reches 2001 Lake levels and sequence stratigraphy of Lake Lisan, the late Pleistocene precursor of the Dead Sea. *Quaternary Research* 57:9–21.
- Bartram, L.E. 1993 Perspectives on skeletal part profiles and utility curves from eastern Kalahari ethnoarchaeology. In *From Bones to Behavior*, edited by J. Hudson, pp. 115–137. Center for Archaeological Investigations, Southern Illinois University, Carbondale.
- Baruch, U. 1994 The Late Quaternary pollen record of the Near East. In *Late Quaternary chronology and palaeoclimates of the eastern Mediterranean*, edited by O. Bar-Yosef and R.S. Kra, pp. 103–119. Radiocarbon, Tucson.
- Baruch, U. and O. Bar-Yosef 1986 Upper Paleolithic assemblages from Wadi Sudr, western Sinai. *Paleorient* 12:69–84.
- Baruch, U., E. Werker and O. Bar-Yosef 1992 Charred wood remains from Kebara Cave, Israel: preliminary results. *Bulletin de la Société Botanique de France* 2–4:531–538.
- Bar-Yosef, D.E. 1989 Late Paleolithic and Neolithic marine shells in the southern Levant as cultural markers. In *Proceedings of the 1986 Shell Bead Conference, Selected Papers*, edited by C.F. Hayes III, L. Ceci and C.C. Bodner, pp. 169–174. Rochester Museum of Science, Rochester, NY.
- Bar-Yosef Mayer, D.E. in press Mollusc shells and “other” finds from the survey and excavations of Northern Sinai. In *Investigations in Northern Sinai*, edited by J.L. Phillips and O. Bar-Yosef.
- Bar-Yosef, O. 1970 *The Epi-Palaeolithic Cultures of Palestine*. Unpublished Ph.D. Thesis, Hebrew University, Jerusalem.
- Bar-Yosef, O. 1973 Nahal Ein Gev I, preliminary report. *Mitekufat Haeven* 11:1–7.
- Bar-Yosef, O. 1991a The search for lithic variability among Levantine Epi-paleolithic industries. In *25 Ans d'Études Technologiques en Préhistoire, XIème Rencontre Internationales d'Archéologie et Histoire d'Antibes*, edited by L. Meignen, pp. 319–336. APDCA, Juan-les-Pins.
- Bar-Yosef, O. 1991b The Archaeology of the Natufian layer at Hayonim Cave. In *The Natufian Culture in the Levant*, edited by O. Bar-Yosef and F.R. Valla, pp. 81–92. International Monographs in Prehistory, Ann Arbor.
- Bar-Yosef, O. 1994 The contributions of southwest Asia to the study of the origins of modern humans. In *Origins of Anatomically Modern Humans*, edited by M.H. Nitecki and D.V. Nitecki, pp. 23–66. Plenum Press, New York.
- Bar-Yosef, O. 1997 Symbolic expressions in later prehistory of the Levant: Why are they so few? In *Beyond Art: Pleistocene Image and Symbol*, edited by M.W. Conkey, O. Soffer, D. Stratmann and N.G. Jablonski, pp. 161–187. Memoirs of the California Academy of Sciences, San Francisco.
- Bar-Yosef, O. 1998a On the nature of transitions: the Middle to Upper Palaeolithic and the Neolithic revolution. *Cambridge Archaeological Journal* 8:141–163.
- Bar-Yosef, O. 1998b The chronology of the Middle Paleolithic of the Levant. In *Neandertals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 39–56. Plenum Press, New York.
- Bar-Yosef, O. 1998c Early colonizations and cultural continuities in the Lower Palaeolithic of Western Asia. In *Early Human Behaviour in Global Context: The Rise and Diversity of the Lower Palaeolithic Record*, edited by M.D. Petraglia and R. Korisettar, pp. 221–279. Routledge, London.
- Bar-Yosef, O. 2000 The Middle and early Upper Palaeolithic in southwest Asia and neighboring regions. In *The Geography of Neandertals and Modern Humans in Europe and the Greater Mediterranean*, edited by O. Bar-Yosef and D. Pilbeam, pp. 107–156. Peabody Museum, Harvard University, Cambridge.
- Bar-Yosef, O., M. Arnold, N. Mercier, A. Belfer-Cohen, P. Goldberg, R. Housley, H. Laville, L. Meignen, J.C. Vogel and B. Vandermeersch 1996 The dating of the Upper Palaeolithic layers in Kebara Cave, Mt. Carmel. *Journal of Archaeological Science* 23:297–306.
- Bar-Yosef, O. and A. Belfer 1977 The Lagaman industry. In *Prehistoric Investigations in Gebel Maghara, Northern Sinai*, edited by O. Bar-Yosef and J.L. Phillips, pp. 42–84. Qedem 7, Monographs of the Institute of Archaeology, Hebrew University Jerusalem.
- Bar-Yosef, O. and A. Belfer-Cohen 1988 The Early Upper Paleolithic in Levantine caves. In *The Early Upper Paleolithic: Evidence from Europe and the Near East*, edited by J.F. Hoffecker and C.A. Wolf, pp. 23–41. BAR International Series 437, Oxford.
- Bar-Yosef, O. and A. Belfer-Cohen 1989 The origins of sedentism and farming communities in the Levant. *Journal of World Prehistory* 40:447–498.
- Bar-Yosef, O. and A. Belfer-Cohen 1996 Another look at the Levantine Aurignacian. *The Late Aurignacian*, edited by A. di Cesnola and A. Montet-White, pp. 139–150. 13th Congress, UISPP, ABACO Edizioni, Forli.
- Bar-Yosef, O. and A. Belfer-Cohen 2001 From Africa to Eurasia: early dispersals. *Quaternary International* 75: 19–28.
- Bar-Yosef, O., P. Goldberg and T. Leveson 1974 Late Quaternary

- stratigraphy and prehistory in Wadi Fazael, Jordan Valley: a preliminary report. *Paléorient* 2:415–428.
- Bar-Yosef, O. and R.S. Kra (editors) 1994 *Late Quaternary Chronology and Paleoclimates of the Eastern Mediterranean*. Radiocarbon, Tucson.
- Bar-Yosef, O. and S.L. Kuhn 1999 The big deal about blades: laminar technologies and human evolution. *American Anthropologist* 101:322–338.
- Bar-Yosef, O. and L. Meignen 1992 Insights into Levantine Middle Paleolithic cultural variability. In *The Middle Paleolithic: Adaptation, Behavior and Variability*, edited by H.L. Dibble and P. Mellars, pp. 163–182. University Museum, University of Pennsylvania, Philadelphia.
- Bar-Yosef, O. and J.L. Phillips (editors) 1977 *Prehistoric Investigations in Gebel Maghara, Northern Sinai*. Qedem 7, Monographs of the Institute of Archaeology, Hebrew University, Jerusalem.
- Bar-Yosef, O. and D. Pilbeam (editors) 2000 *The Geography of Neandertals and Modern Humans in Europe and the Greater Mediterranean*. Peabody Museum, Harvard University, Cambridge.
- Bar-Yosef, O. and E. Tchernov 1966 Archaeological finds and the fossil faunas of the Natufian and Microlithic industries at Hayonim Cave (western Galilee, Israel). *Israel Journal of Zoology* 15:104–140.
- Bar-Yosef, O. and B. Vandermeersch 1972 The stratigraphical and cultural problems of the passage from Middle to Upper Paleolithic in Palestinian caves. In *The Origins of Homo Sapiens*, edited by F. Bordes, pp. 221–225. UNESCO, Paris.
- Bar-Yosef, O., B. Vandermeersch, B. Arensburg, A. Belfer-Cohen, P. Goldberg, H. Laville, L. Meignen, Y. Rak, J.D. Speth, E. Tchernov, A.-M. Tillier and S. Weiner 1992 The excavations in Kebara Cave, Mt. Carmel. *Current Anthropology* 33:497–550.
- Bar-Yosef, O. and J.C. Vogel 1987 Relative and absolute chronology of the Epi-Palaeolithic in the Southern Levant. In *Chronologies in the Near East*, edited by O. Aurenche, J. Evin and F. Hours, pp. 219–245. BAR International Series 379, Oxford.
- Basalla, G. 1988 *The Evolution of Technology*. Cambridge University Press, Cambridge.
- Bate, D.M.A. 1927 On the animal remains obtained from the Mugharet el-Emireh in 1925. In *Researches in Prehistoric Galilee, 1925–1926 and a Report on the Galilee Skull*, edited by F. Turville-Petre, pp. 9–13. British School of Archaeology, Jerusalem.
- Bate, D.M.A. 1937 Part II. Paleontology: the fossil fauna of the Wady el-Mughara Caves. In *The Stone Age of Mount Carmel. Excavations at the Wadi-Mughara, vol. I*, edited by D.A.E. Garrod and D.M.A. Bate, pp. 139–233. Clarendon Press, Oxford.
- Baumler, M.F. 1988 Core reduction, flake production, and the Middle Paleolithic industry of Zobiste (Yugoslavia). In *Upper Pleistocene Prehistory of Western Eurasia*, edited by H.L. Dibble and A. Montet-White, pp. 255–274. University Museum, University of Pennsylvania, Philadelphia.
- Beck, J.W., D.A. Richards, R.L. Edwards, B.W. Silverman, P.L. Smart, D.J. Donahue, S. Herrera-Osterheld, G.S. Burr, L. Calsoyas, A.J.T. Jull and D. Biddulph 2001 Extremely large variations of atmospheric ¹⁴C concentration during the Last Glacial period. *Science* 292:2453–2458.
- Becker, M.S. 1999 *Reconstructing Prehistoric Hunter-Gatherer Mobility Patterns and the Implications for the Shift to Sedentism: A Perspective from the Near East*. Unpublished Ph.D. Thesis, University of Colorado, Boulder.
- Belfer-Cohen, A. 1980 *The Aurignacian at Hayonim Cave*. Unpublished MA Thesis, Hebrew University, Jerusalem (Hebrew).
- Belfer-Cohen, A. 1994 Problems in defining a prehistoric culture: an example from the southern Levant. In *Nature et Culture*, edited by M. Otte, pp. 247–260. ERAUL, Liège.
- Belfer-Cohen, A. and O. Bar-Yosef 1981 The Aurignacian in Hayonim Cave. *Paléorient* 7:19–42.
- Belfer-Cohen, A. and O. Bar-Yosef 1999 The Levantine Aurignacian: 60 years of research. In *Dorothy Garrod and the Progress of the Palaeolithic*, edited by W. Davies and R. Charles, pp. 118–134. Oxbow, Oxford.
- Belfer-Cohen, A., I. Gilead, A.N. Goring-Morris and S. Rosen 1991 An Epipalaeolithic rockshelter at Nahal Neqarot in the central Negev. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 24:164–168.
- Belfer-Cohen, A. and P. Goldberg 1982 Upper Palaeolithic sites in Wadi Feiran, southern Sinai. *Israel Exploration Journal* 32:185–189.
- Belfer-Cohen, A. and A.N. Goring-Morris 1986 Har Horesha I: an Upper Palaeolithic site in the central Negev highlands. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 19:43–57.
- Belfer-Cohen, A. and A.N. Goring-Morris 2--2 Why microliths? Microlithisation in the Levant. In *Thinking Small: Global Perspectives on Microlithic Technologies*, edited by R.G. Elston and S.L. Kuhn, pp. 57–68 AP3A, Washington, D.C.
- Belfer-Cohen, A. and L. Grosman in press Tools or cores? Carinated artifacts in Levantine Upper Paleolithic assemblages and why does it matter. In *Cores or Tools?*, edited by S.P. McPherron and J. Lindly, University Museum, University of Philadelphia.
- Belfer-Cohen, A. and E. Hovers 1992 In the eye of the beholder: Mousterian and Natufian burials in the Levant. *Current Anthropology* 33:463–471.
- Bergman, C.A. 1981 Point types in the Upper Palaeolithic sequence at Ksar Akil, Lebanon. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, pp. 319–330. CNRS, Paris.
- Bergman, C.A. 1987a *Ksar Akil, Lebanon. A Technological and Typological Analysis of the Later Palaeolithic Levels of Ksar Akil. Vol. II: Levels XIII–VI*. BAR International Series 329, Oxford.
- Bergman, C.A. 1987b Hafting and use of bone and antler tools from Ksar Akil, Lebanon. In *Manches et Emmanchements Préhistoriques*, edited by D. Stordeur, pp. 117–126. Maison de l’Orient, Lyon.
- Bergman, C.A. 1988a Ksar Akil and the Upper Paleolithic of the Levant. *Paléorient* 14: 201–211.
- Bergman, C.A. 1988b Synthèse: the Upper Paleolithic of the Levant. *Paléorient* 14: 223–227.
- Bergman, C.A. and A.N. Goring-Morris 1987 Conference: the Levantine Aurignacian with special reference to Ksar Akil, Lebanon, March 27–28, 1987. *Paléorient* 13:140–145.
- Bergman, C.A., E. McEwen and R. Miller 1998 Experimental archery: projectile velocities and comparison of bow performances. *Antiquity* 62:658–670.
- Bergman, C.A. and M.H. Newcomer 1983 Flint arrowheads breakage: examples from Ksar Akil, Lebanon. *Journal of Field Archaeology* 10:238–243.
- Bergman, C.A. and C.B. Stringer 1989 Fifty years after: Egbert, an Upper Palaeolithic juvenile from Ksar Akil, Lebanon. *Paléorient* 15:99–111.
- Besaçon, J. 2000 Observations sur la géomorphologie du Hatay (Turquie): evolution au Quaternaire dans la Vallée de l’Orontes, les bassins de l’Amouq et sur la côte. *Annales de Géographie* 19:1–121.
- Besaçon, J., L. Copeland and F. Hours 1975–77 Tableaux de préhistoire Libanaise. *Paléorient* 3:5–45.
- Bettinger, R. 1991 *Hunter-gatherers: Archaeological and Evolutionary Theory*. Plenum Press, New York.

- Beyries, S. 1988 Functional variability of lithic sets in the Middle Paleolithic. In *Upper Pleistocene Prehistory of Western Eurasia*, edited by H.L. Dibble and A. Montet-White, pp. 213–224. The University Museum, University of Pennsylvania, Philadelphia.
- Beyries, S. 1993 Expérimentation archéologique et savoir-faire traditionnel: L'exemple de la découpe d'un cervide. *Techniques et Culture* 21:53–79.
- Binford, L.R. 1978 *Nunamiut Ethno-Archaeology*. Academic Press, New York.
- Binford, L.R. 1980 Willow smoke and dogs' tails: hunter-gatherer settlement systems and archaeological site formation. *American Antiquity* 45:4–20.
- Binford, L.R. 1981 Behavioral archaeology and the "Pompeii Premise". *Journal of Anthropological Research* 37:195–208.
- Binford, L.R. 1983 *In Pursuit of the Past*. Thames and Hudson, London.
- Binford, L.R. and S.R. Binford 1966 A preliminary analysis of functional variability in the Mousterian of Levallois facies. *American Anthropologist* 68:238–295.
- Binford, S.R. 1968 Early Upper Pleistocene adaptations in the Levant. *American Anthropologist* 70:707–717.
- Bischoff, J.L., N. Soler, J. Maroto and R. Julia 1989 Abrupt Mousterian/Aurignacian boundary at c. 40 kya bp: accelerator C 14 dates from L'Abreda Cave (Catalunya, Spain). *Journal of Archaeological Science* 16:563–576.
- Bisson, M.S. 2000 Nineteenth century tools for twenty-first century archaeology? Why the Middle Paleolithic typology of François Bordes must be replaced. *Journal of Archaeological Method and Theory* 7:1–48.
- Blades, B. 1999 Aurignacian settlement patterns in the Vézère Valley. *Current Anthropology* 40:712–719.
- Blanton, R.E. 1995 Patterns of exchange and the social production of pigs in the highland of New Guinea: their relevance to questions about the origins and evolution of agriculture. *Journal of Archaeological Research* 3:113–145.
- Blust, R. 1995 The prehistory of the Austronesian-speaking peoples: a view from language. *Journal of World Prehistory* 9:453–510.
- Bocquet-Appel, J.-P. and P.Y. Demars 2000 Neanderthal contraction and modern human colonization of Europe. *Antiquity* 74:544–552.
- Boëda, E. 1986 *Une Approche Technologique du Concept Levallois et l'Évolution de Son Champ d'Application – Une Étude de Trois Gisements Saaliens et Weichseliens du Nord de la France*. Unpublished Ph.D. Thesis, Paris X, Nanterre.
- Boëda, E. 1988a Analyse technologique du débitage du niveau IIA. In *Le Gisement Paléolithique Moyen de Biache-Saint-Vaast (Pas-de-Calais)*, vol. 1, edited by A. Tuffreau and J. Somme, pp. 185–214. Mémoires de la Société Préhistorique Française, Paris.
- Boëda, E. 1988b Le concept Levallois et l'évaluation de son champ d'application. In *L'Homme de Néandertal, Vol 4: La Technologie*, edited by M. Otte, pp. 13–26. ERAUL, Liège.
- Boëda, E. 1991 Approche de la variabilité des systèmes de production lithique des industries du Paléolithique inférieur et moyen: chronique d'une variabilité attendue. *Techniques et Culture* 17–18:37–79.
- Boëda, E. 1994 *Le Concept Levallois: Variabilité des Méthodes*. CNRS, Paris.
- Boëda, E. 1995a Levallois: a volumetric construction, methods, technique. In *The Definition and Interpretation of Levallois Technology*, edited by H.L. Dibble and O. Bar-Yosef, pp. 41–69. Prehistoric Press, Madison.
- Boëda, E. 1995b Caractéristiques Techniques des Chaînes Opératoires Lithiques des Niveaux Micoquiens de Kůlna (Tchécoslovaquie). *Paléo* (Supplement) 1:57–72.
- Boëda, E., J. Connant, D. Dessort, S. Muhesen, N. Mercier, H. Valladas and N. Tesnerat 1996 Bitumen as a hafting material on Middle Paleolithic artifacts. *Nature* 380:336–338.
- Boëda, E., J.-M. Gènesse and L. Meignen 1990 Identification de chaînes opératoires lithiques du Paléolithique ancien et moyen. *Paléo* 2:43–80.
- Boëda, E. and S. Muhesen 1993 Umm el Tlel (el Kowm, Syrie): étude préliminaire des industries lithiques du Paléolithique moyen et supérieur 1991–1992. *Cahiers de l'Euphrate* 7:47–91.
- Bond, G., W. Broecker, S. Johnsen, J. McManus, L. Labeyrie, J. Jouzel and G. Bonani 1993 Correlations between climate records from North Atlantic sediments and Greenland ice. *Nature* 365:143–147.
- Bond, G., H. Heinrich, W. Broecker, L. Labeyrie, J. McManus, J. Andrews, S. Huon, R. Jantschik, S. Clashen, C. Simet, K. Tedesco, M. Klas, G. Bonani and S. Ivy 1992 Evidence for massive discharges of icebergs into the North Atlantic Ocean during the last glacial period. *Nature* 360:245–249.
- Bonnichsen, R. 1977 *Models for Deriving Cultural Information from Stone Tools*. National Museum of Man, Archaeological Survey of Canada, Ottawa.
- Bordes, F. 1961a *Typologie du Paléolithique Ancien et Moyen*. Publication de l'Institut de Préhistoire de l'Université de Bordeaux, Bordeaux.
- Bordes, F. 1961b Mousterian cultures in France. *Science* 134:803–810.
- Bordes, F. 1968a La question Périgordienne. In *Le Préhistoire. Problèmes et Tendances*, pp. 59–70. CNRS, Paris.
- Bordes, F. 1968b *The Old Stone Age*. McGraw-Hill, New York.
- Bordes, F. 1972 Du Paléolithique moyen au Paléolithique supérieur: continuité ou discontinuité. In *The Origin of Homo Sapiens*, edited by F. Bordes, pp. 211–218. UNESCO, Paris.
- Bordes, F. 1980 Le débitage Levallois et ses variantes. *Bulletin de la Société Préhistorique Française* 77:45–49.
- Bordes, F. 1992 *Leçons sur le Paléolithique, Tome II*. CNRS Plus, Paris.
- Bordes, F. and D. de Sonneville-Bordes 1971 The significance of variability in Palaeolithic assemblages. *World Archaeology* 2:61–73.
- Bosinski, G. 1990 *Homo sapiens: l'Histoire des Chasseurs du Paléolithique Supérieur en Europe, 40,000–10,000 avant J.-C.* Éditions Errance, Paris.
- Bostanci, E. 1968 Ma aralık evresinde Yapılan 1966. Yaz Mevsimi Kazıları ve Yeni Buluntular. *Antropoloji* 3:19–45.
- Bouchud, J. 1974 Étude préliminaire de la faune provenant de la grotte du Djebel Qafzeh, près de Nazareth, Israël. *Paléorient* 2:87–102.
- Bourguignon, L. 1996 Un Mousterien tardif sur le site d'Umm el Tlel (Bassin d'el Khowm, Syrie)? Exemples des niveaux II base' et III2A'. In *The Last Neandertals, The First Anatomically Modern Humans*, edited by E. Carbonell and M. Vaquero, pp. 317–336. Universitat Rovira i Virgili, Barcelona.
- Bourguignon, L. 1998 Les industries du Paléolithique intermédiaire d'Umm el Tlel. Nouveaux éléments pour le passage entre Paléolithique moyen et supérieur dans le Bassin d'El Khowm. In *Préhistoire d'Anatolie. Genèse de Deux Mondes*, edited by M. Otte, pp. 709–730. ERAUL, Liège.
- Bouyssonie, J. 1948 Un gisement Aurignacien et Périgordien. Les Vachons (Charente). *L'Anthropologie* 52:1–42.
- Braithwaite, M. 1982 Decoration as ritual symbol: a theoretical proposal and an ethnographic study in southern Sudan. In *Symbolic and Structural Archaeology*, edited by I. Hodder, pp. 80–88. Cambridge University Press, Cambridge.
- Brantingham, P.J., J.W. Olsen and G.B. Schaller 2001 Lithic assemblages from the Chang Tang region, northern Tibet. *Antiquity* 75:319–327.

- Breuil, H. 1906 Les gisements Présolutréens du type d'Aurignac. In *Coup d'Œil sur le Plus Ancien Age du Renne*, pp. 323–350. CIAAP, Monaco.
- Breuil, H. 1913 *Subdivisions de Paléolithique supérieur et leur signification*, Geneva.
- Brézillon, M. 1971 *La Dénomination des Objets de Pierre Taillée, Matériaux pour un Vocabulaire de Préhistoriens de Langue Française*. IV^e Supplément à Gallia Préhistoire. Reprint of 1st edition, with additional text. CNRS, Bordeaux.
- Burke, A. (editor) 2000 *Hunting in the Middle Paleolithic*. Special Issue of *The International Journal of Osteoarchaeology* 10(5).
- Butzer, K. 1982 *Archaeology as Human Ecology: Method and Theory for a Contextual Approach*. Cambridge University Press, Cambridge.
- Byrd, B.F. 1988 Late Pleistocene assemblage diversity in the Azraq Basin. *Paléorient* 14:257–265.
- Byrd, B.F. 1989 *The Natufian Encampment at Beidha: Late Pleistocene Adaptations in the Southern Levant*. Jutland Archaeological Society Publications, Aarhus, Denmark.
- Byrd, B.F. 1994 Late Quaternary hunter-gatherer complexes in the Levant between 20,000 and 10,000 BP. In *Late Quaternary Chronology and Paleoclimates of the Eastern Mediterranean*, edited by O. Bar-Yosef and R.S. Kra, pp. 205–266. Radio-carbon, Tucson.
- Byrd, B.F. 1998 Spanning the gap from the Upper Paleolithic to the Natufian: the Early and Middle Epipalaeolithic. In *The Prehistoric Archaeology of Jordan*, edited by D.O. Henry, pp. 64–82. BAR International Series 705, Oxford.
- Cabrera Valdes, V., and J.L. Bischoff 1989 Accelerator C 14 ages for basal Aurignacian at El Castillo (Spain). *Journal of Archaeological Science* 16:577–584.
- Cahen, D. and L.H. Keeley 1980 Not less than two, not more than three. *World Archaeology* 12:166–180.
- Cahen, D., L.H. Keeley and F.L. Van Noten 1979 Stone tools, toolkits, and human behavior in Prehistory. *Current Anthropology* 20:661–683.
- Calley, S. 1986 *Téchnologie du Débitage a Mureybet, Syrie*. BAR International Series 312, Oxford.
- Carr, C. 1984 The nature of organization of intrasite archaeological records and spatial analytic approaches to their investigation. In *Advances in Archaeological Method and Theory*, vol. 7, edited by M. Schiffer, pp. 103–222. Academic Press, New York.
- Cerling, T.E. and J. Quade 1993 Stable carbon and oxygen isotopes in soil carbonates. In *Climate Change in Continental Isotopic Records*, edited by P.K. Swart, K.C. Lohman, J. McKenzie and S. Savin, pp. 217–231. Geophysical Monograph 78, American Geophysical Union.
- Cerling, T.E., J. Quade, D.K. Solomon and J.R. Bowman 1991 On the carbon isotopic composition of soil carbon dioxide. *Geochimica et Cosmochimica Acta* 55:3403–3405.
- Chauvet, J.-M., E.B. Deschamps and C. Hillaire 1996 *Dawn of Art: The Chauvet Cave*. H.N. Abrams, New York.
- Chazan, M. 1995 The language hypothesis for the Middle to Upper Paleolithic transition. *Current Anthropology* 36:749–768.
- Chazan, M. 1997 Redefining Levallois. *Journal of Human Evolution* 33:719–735.
- Chazan, M. 2001 Bladelet production in the Aurignacian of Hayonim Cave, Israel. *Paléorient* 27:81–88.
- Chazan, M. in press Bladelet production in the Aurignacian of La Ferrassie (Dordogne, France). *Lithic Technology*.
- Cheddadi, R. and M. Rossignol-Strick 1995 Eastern Mediterranean Quaternary paleoclimates from pollen and isotope records of marine cores in the Nile cone area. *Paleoceanography* 10:291–300.
- Childs, S.T. 1991 Style, technology, and iron smelting furnaces in Bantu-speaking Africa. *Journal of Anthropological Archaeology* 10:332–359.
- Chun, C. and W. Xiang-Qian 1989 Upper Paleolithic microblade industries in north China and their relationships with northeast Asia and north America. *Arctic Anthropology* 26:127–156.
- Clark, A. 1997 *Being There: Putting Brain, Body, and World Together Again*. MIT Press, Cambridge.
- Clark, G.A. 1991 Epilogue: paradigms, realism, adaptation, and evolution. In *Perspectives on the Past: Theoretical Biases on Mediterranean Hunter-Gatherer Research*, edited by G.A. Clark, pp. 411–439. University of Pennsylvania Press, Philadelphia.
- Clark, G.A. 1997 Through a glass darkly. Conceptual issues in modern human origins research. In *Conceptual Issues in Modern Human Origins Research*, edited by G.A. Clark and C.M. Willermet, pp. 60–76. Aldine de Gruyter, New York.
- Clark, G.A. and J.M. Lindly 1989 Modern human origins in the Levant and western Asia: the fossil and archaeological evidence. *American Anthropologist* 91:962–985.
- Clark, G.A., J.M. Lindly, M. Donaldson, A.N. Garrard, N.R. Coinman, J. Schuldenrein, S.K. Fish and D.I. Olszewski 1987 Paleolithic archaeology in the southern Levant: a preliminary report of excavations at Middle, Upper and Epipaleolithic sites in Wadi al-Hasa, west-central Jordan. *Annual of the Department of Antiquities of Jordan* 31:19–78.
- Clark, G.A., J.M. Lindly, M. Donaldson, A.N. Garrard, N.R. Coinman, J. Schuldenrein, S.K. Fish and D.I. Olszewski 1988 Excavations at Middle, Upper and Epipalaeolithic sites in Wadi Hasa, west-central Jordan. In *The Prehistory of Jordan: State of Research in 1986*, edited by A.N. Garrard and H.-G. Gebel, pp. 209–285. BAR International Series 396(i), Oxford.
- Clark, G.A., J.M. Lindly, M. Donaldson, A.N. Garrard, N.R. Coinman, S.K. Fish and D.I. Olszewski 2000 Paleolithic Archaeology in the Southern Levant: a preliminary report of excavations at Middle, Upper and Epipaleolithic sites in the Wadi al-Hasa, West-Central Jordan. In *The Archaeology of the Wadi al-Hasa, West-Central Jordan, vol. 2: Excavations at Middle, Upper and Epipaleolithic Sites*, edited by N.R. Coinman, pp. 17–66. Arizona State University, Tempe.
- Clark, G.A., M.P. Neeley, B. MacDonald, J. Schuldenrein and K. 'Amr 1992 Wadi al-Hasa Paleolithic project –1992: preliminary report. *Annual of the Department of Antiquities of Jordan* 36:13–23.
- Clark, G.A., D.I. Olszewski, J. Schuldenrein, N. Rida and D. Eighmey 1994 Survey and excavation in Wadi Al-Hasa: a preliminary report of the 1993 field season. *Annual of the Department of Antiquities of Jordan* 38:41–55.
- Clark, G.A., J. Schuldenrein, M. Donaldson, H. Schwarcz, W. Rink and S.K. Fish 1997 Chronostratigraphic contexts of Middle Paleolithic horizons at the 'Ain Difla rockshelter (WHS 634), west-central Jordan. In *The Prehistory of Jordan, II. Perspectives from 1997*, edited by H.-G. Gebel, Z. Kafafi and G.O. Rollefson, pp. 77–100. SENEPESE 4. ex oriente, Berlin.
- Clark, J.G.D. and W.F. Rankine 1939 Excavations at Farnham, Survey (1937–1938). *Proceedings of the Prehistoric Society* 5:61–118.
- Clarke, D.L. 1978 *Analytical Archaeology*, 2nd edition. Methuen, London.
- Close, A.E. 2000 Reconstructing movement in prehistory. *Journal of Archaeological Method and Theory* 7:49–77.
- Coinman, N.R. 1990 *Refiguring the Levantine Upper Paleolithic: A Comparative Examination of Lithic Assemblages from the Southern Levant*. University Microfilms International, Ann Arbor.
- Coinman, N.R. 1993a *The Upper Paleolithic in the Southern Levant: New Data from South Jordan*. Paper presented at the 58th Annual Meeting of the SAA, St. Louis.
- Coinman, N.R. 1993b WHS 618 – Ain el-Buhira: an Upper

- Paleolithic site in the Wadi Hasa, west-central Jordan. *Paléorient* 19:17–37.
- Coinman, N.R. 1997a The Upper Palaeolithic in Jordan: evidence from the Wadi al-Hasa and south Jordan. *Studies in the History and Archaeology of Jordan* 6:209–217.
- Coinman, N.R. 1997b Upper Palaeolithic technologies: core reduction strategies. In *The Prehistory of Jordan II: Perspectives from 1997*, edited by H.-G. Gebel, Z. Kafafi and G.O. Rollefson, pp. 111–123. SENEPSE 4. ex oriente, Berlin.
- Coinman, N.R. 1997c Worked bone in the Levantine Upper Paleolithic: rare examples from the Wadi al-Hasa, west-central Jordan. *Paléorient* 22:121–131.
- Coinman, N.R. 1998a The Upper Paleolithic of Jordan. In *The Prehistoric Archaeology of Jordan*, edited by D.O. Henry, pp. 38–63. BAR International Series 705, Oxford.
- Coinman, N.R. 1998b *Ain al-Buhayra (WHS 618): A Late Upper Paleolithic Site in West-Central Jordan*. Paper presented at the 63rd Annual Meeting of the SAA, Seattle.
- Coinman, N.R. 2000 The Upper Paleolithic in the Wadi al-Hasa. In *The Archaeology of the Wadi al-Hasa, West-Central Jordan, vol. 2: Excavations at Middle, Upper and Epipaleolithic Sites*, edited by N.R. Coinman, pp. 143–159. Arizona State University, Tempe.
- Coinman, N.R., G.A. Clark and M.L. Donaldson 1989 Aspects of structure in an Epipaleolithic site in west central Jordan. In *Alternative Approaches to Lithic Analysis*, edited by D.O. Henry and G.H. Odell, pp. 213–236. AP3A, University of Tulsa, Tulsa.
- Coinman, N.R., G.A. Clark and J.M. Lindly 1986 Prehistoric hunter-gatherer settlement in the Wadi Hasa, west-central Jordan. In *The End of the Paleolithic in the Old World*, edited by L.G. Strauss, pp. 129–170. BAR International Series 284, Oxford.
- Coinman, N.R. and J.R. Fox 2000 Tor Sadaf (WHNBS 8): the transition to the Upper Paleolithic. In *The Archaeology of the Wadi al-Hasa, West-Central Jordan, vol. 2: Excavations at Middle, Upper and Epipaleolithic Sites*, edited by N.R. Coinman, pp. 123–142. Arizona State University, Tempe.
- Coinman, N.R. and D.O. Henry 1995 The Upper Palaeolithic sites. In *Prehistoric Cultural Ecology and Evolution. Insights from Southern Jordan*, edited by D.O. Henry, pp. 133–214. Plenum, New York.
- Coinman, N.R., D.I. Olszewski, K. Abdo, T.G. Clausen, J.B. Cooper, J.R. Fox, M. al-Nahar, E. Richey and L.S. Saele 1999 The eastern al-Hasa Late Pleistocene project: preliminary report on the 1998 season. *Annual of the Department of Antiquities of Jordan* 43:9–25.
- Coles, J.M. and E.S. Higgs 1969 *The Archaeology of Early Man*. Faber and Faber, London.
- Collins, D. 1986 *Palaeolithic Europe: A Theoretical and Systematic Study*. Clayhanger Books, Devon.
- Collins, M. 1975 Lithic technology as a means of processual inference. In *Lithic Technology: Making and Using Stone Tools*, edited by E.H. Swanson, pp. 15–34. Mouton, The Hague.
- Collins, M. 1999 *Clovis Blade Technology*. University of Texas Press, Austin.
- Conard, N. 1990 Laminar lithic assemblages from the last Interglacial complex in northwestern Europe. *Journal of Anthropological Research* 46:243–262.
- Conkey, M.W. 1980 The identification of prehistoric hunter-gatherer aggregation sites: the case of Altamira. *Current Anthropology* 21:609–631.
- Copeland, L. 1970 The Early Upper Palaeolithic flint material from Antelias Cave, Lebanon, Levels VII–V. *Berytus* 19:99–149.
- Copeland, L. 1975 The Middle and Upper Paleolithic of Lebanon and Syria in the light of recent research. In *Problems in Prehistory: North Africa and the Levant*, edited by F. Wendorf and A.E. Marks, pp. 317–350. SMU Press, Dallas.
- Copeland, L. 1976 Terminological correlations in the Early Upper Palaeolithic of Lebanon and Palestine. In *Deuxième Colloque sur la Terminologie de la Préhistoire du Proche-Orient*, edited by F. Wendorf, pp. 35–48. 9th Congress, UISPP, Nice.
- Copeland, L. 1982 The Ksar Akil scraper: a late Upper Palaeolithic tool-type of the Levant. In *Archéologie au Levant. Recueil R. Saidah*, edited by F. Hours and A. Starkey, pp. 57–67. CNRS, Lyon.
- Copeland, L. 1983 Levallois/non-Levallois determinations in the Early Levantine Mousterian: problems and questions for 1983. *Paléorient* 9:15–27.
- Copeland, L. 1986 Introduction. In *Ksar Akil, Lebanon: A Technological and Typological Analysis of Transitional and Early Upper Palaeolithic Levels at Ksar Akil and Abu Halka. Volume 1: Levels XXV–XII*, edited by I. Azoury, pp. 1–19. BAR International Series 289, Oxford.
- Copeland, L. 1987 Preface. In *Ksar Akil, Lebanon: A Technological and Typological Analysis of the Later Upper Palaeolithic Levels. Volume II: Levels XIII–VI*, edited by C.A. Bergman, pp. iv–ix. BAR International Series 329, Oxford.
- Copeland, L. 1997 Status, perspectives and future goals in Jordanian Palaeolithic research. In *The Prehistory of Jordan II. Perspectives from 1997*, edited by H.-G. Gebel, Z. Kafafi and G.O. Rollefson, pp. 183–192. SENEPSE 4. ex oriente, Berlin.
- Copeland, L. 2000 Forty-six Emireh points from the Lebanon in the context of the Middle to Upper Paleolithic transition in the Levant. *Paléorient* 26:73–92.
- Copeland, L. and F. Hours 1971 The late Upper Palaeolithic material from Antelias Cave, Lebanon, Levels IV–I. *Berytus* XX:57–138.
- Cotterell, B., J. Kamminga and F.D. Dickson 1985 The essential mechanics of concoidal flaking. *International Journal of Fracture* 20:205–221.
- Courty, M.-A., P. Goldberg and R.I. Macphail 1989 *Soils and Micromorphology in Archaeology*. Cambridge University Press, Cambridge.
- Courty, M.-A., R.I. Macphail and J. Watez 1991 Soil micromorphological indicators of pastoralism: with special reference to Arene Candide, Finale Ligure, Italy. *Revista di Studi Liguri* LVII:127–150.
- Cresswell, R. 1982 Transferts de techniques et chaînes opératoires. *Techniques et Culture* 2:143–163.
- Cresswell, R. 1992 Tendances et fait, logique et histoire. *Techniques et Culture* 21:37–59.
- Crew, H.L. 1975 *An Examination of the Variability of the Levalloisian Method: Its Implications for the Internal and External Relationships of the Levantine Mousterian*. University Microfilms International, Ann Arbor.
- Dansgaard, W., S.J. Johnsen, H.B. Clausen, D. Dahl-Jensen, N.S. Gundestrup, C.U. Hammer, C.S. Hvidberg, J.P. Steffensen, A.E. Sveinbjornsdottir, J. Jouzel and G. Bond 1993 Evidence for general instability of past climate from a 250-kyr ice-core record. *Nature* 364:218–220.
- Davidzon, A. 2002 *Sealed in Stone: Early Ahmarian Knapping Traditions as Seen at Nahal Nizzana XIII, Israel*. Unpublished MA Thesis, Hebrew University, Jerusalem (Hebrew).
- Davis, S.J.M. 1974a Incised bones from the Mousterian of Kebara Cave (Mount Carmel) and the Aurignacian of Ha-Yonim Cave (western Galilee), Israel. *Paléorient* 2:181–182.
- Davis, S.J.M. 1974b Animal remains from the Kebaran site of Ein Gev I, Jordan Valley, Israel. *Paléorient* 2:453–462.
- Davis, S.J.M. 1977a Size variation of the fox, *Vulpes vulpes* in the palaeartic region today, and in Israel during the late Quaternary. *Journal of Zoology, London* 182:343–351.

- Davis, S.J.M. 1977b The ungulate remains from Kebara Cave. *Eretz Israel* 13:150–163.
- Davis, S.J.M. 1980 Pleistocene and Holocene equid remains from Israel. *Journal of the Linnean Society* 70:289–312.
- Davis, S.J.M. 1981 The effects of temperature change and domestication on the body size of Late Pleistocene to Holocene mammals of Israel. *Paleobiology* 7:101–114.
- Davis, S.J.M. 1982 Climate change and the advent of domestication: the succession of ruminant artiodactyls in the Late Pleistocene–Holocene period in the Israel region. *Paléorient* 8:2–16.
- Davis, S.J.M. 1983 The age profiles of gazelles predated by ancient man in Israel: possible evidence for a shift from seasonality to sedentism in the Natufian. *Paléorient* 9:55–62.
- Dayan, T. 1989 *The Succession and Community Structure of the Carnivores of the Middle East in Time and Space*. Unpublished Ph.D. Thesis, Tel Aviv University, Tel Aviv (Hebrew, English summary).
- Dayan, T. 1994 Carnivore diversity in the Late Quaternary of Israel. *Quaternary Research* 41:343–349.
- Dayan, T., D. Simberloff, E. Tchernov and Y. Yom-Tov 1991 Calibrating the paleothermometer: climate, communities, and the evolution of size. *Paleobiology* 17:189–199.
- Deacon, H.J. 1992 Southern Africa and modern human origins. *Philosophical Transactions of the Royal Society* 337:177–183.
- Deacon, H.J. 1996 Southern Africa in the debate on the origins of modern people. In *The Lower and Middle Paleolithic*, edited by O. Bar-Yosef, L. Cavalli-Sforza, R. March and M. Piperno, pp. 167–172. ABACO, Forlì.
- Deacon, H.J. and J. Deacon 1999 *Human Beginnings in South Africa: Uncovering the Secrets of the Stone Age*. Altamira Press, Walnut Creek, CA.
- Debénath, A. and H.L. Dibble 1994 *Handbook of Paleolithic Typology. Volume One: Lower and Middle Paleolithic of Europe*. University Museum, University of Pennsylvania, Philadelphia.
- Deetz, J. and E. Dethlefsen 1965 The Doppler Effect and archaeology: a consideration of the spatial aspects of seriation. *Southwestern Journal of Anthropology* 21:196–206.
- Delporte, H. 1968 L'Abri du Facteur à Tursac. *Gallia Préhistoire* 11:1–112.
- Demars, P.-Y. and P. Laurent 1989 *Types d'Outils Lithiques du Paléolithique Supérieur en Europe*. CNRS, Paris.
- Demidenko, Y. and V. Usik 1993a The problem of changes in Levallois technique during the technological transition from the Middle to Upper Palaeolithic. *Paléorient* 19:5–15.
- Demidenko, Y. and V. Usik 1993b On the *lame à crête* technique in the Palaeolithic. *Préhistoire Européenne* 4:33–48.
- Derevianko, A.P., V.T. Petrin and E.P. Rybin 2000 The Karabom site and the characteristics of the Middle-Upper Paleolithic transition in the Altai. *Archaeology, Ethnology, and Anthropology of Eurasia* 2:33–52.
- d'Errico, F., C.S. Henshilwood and P. Nilssen 2001 An engraved bone fragment from c. 70,000-year-old Middle Stone Age levels at Blombos Cave, South Africa: implications for the origin of symbolism and language. *Antiquity* 75:309–318.
- d'Errico, F., P. Jardon-Giner and B.S. Major 1993 Critères à base expérimentale pour l'étude des perforations naturelles et artificielles sur coquillages. In *Traces et Fonction: les Gestes Retrouvés*, edited by P.C. Anderson, S. Beyries, M. Otte and H. Plisson, pp. 243–254. ERAUL, Liège.
- d'Errico, F., J. Zilhao, M. Julien, D. Baffier and J. Pelegrin 1998 Neanderthal acculturation in Europe? A critical review of the evidence and its interpretation. *Current Anthropology* 39:1–44.
- Dibble, H.L. 1987 The interpretation of Middle Paleolithic scraper morphology. *American Antiquity* 52:109–117.
- Dibble, H.L. 1995a Biache Saint-Vaast, Level IIA: a comparison of analytical approaches. In *The Definition and Interpretation of Levallois Technology*, edited by H.L. Dibble and O. Bar-Yosef, pp. 93–116. Prehistory Press, Madison.
- Dibble, H.L. 1995b Middle Paleolithic scraper reduction: background, clarification, and review of the evidence to date. *Journal of Archaeological Method and Theory* 2:299–368.
- Dibble, H.L. and A. Pelcin 1995 The effect of hammer mass and velocity on flake mass. *Journal of Archaeological Science* 22:429–439.
- Dibble, H.L. and J. Whittaker 1981 New experimental evidence on the relation between percussion flaking and flake variation. *Journal of Archaeological Science* 6:283–296.
- Djindjian, F., J.K. Kozłowski and M. Otte 1999 *Le Paléolithique Supérieur en Europe*. Armand Colin, Paris.
- Donahue, J. and D. Beynon 1988 Geologic history of the Wadi el Hasa survey area. In *The Wadi el Hasa Archeological Survey 1979–1983, West-Central Jordan*, edited by B. MacDonald, pp. 26–39. Wilfrid Laurier University Press, Waterloo, Canada.
- Dorale, J.A., R.L. Edwards, E. Ito and L.A. Gonzalez 1998 Climate and vegetation history of the midcontinent from 75 to 25 ka: a speleothem record from Crevice cave, Missouri, USA. *Science* 282:1871–1874.
- Dortch, C. 1970 *The Late Aurignacian Industries of Levels 8–6 at Ksar 'Akil, Lebanon*. Unpublished MA Thesis, UCL, London.
- Echegaray, G.J. 1964 *Excavaciones en la Terraza de "El Khiam" (Jordania)*. Bibliotheca Praehistorica Hispana V, vol. 1, Madrid.
- Echegaray, G.J. 1966 *Excavaciones en la Terraza de "El Khiam" (Jordania)*. Bibliotheca Praehistorica Hispana V, vol. 2, Madrid.
- Echegaray, G.J. 1978 Notes toward a systematization of the Upper Paleolithic in Palestine. In *Views of the Past: Essays in Old World Prehistory and Paleoanthropology*, edited by L.G. Freeman, pp. 177–191. Mouton Publishers, The Hague.
- Edwards, P.C. 1990 Kebaran occupation at the Last Glacial Maximum in Wadi al-Hammeh, Jordan valley. In *The World at 18,000 B.P. Volume 2, Low Latitudes*, edited by C. Gamble and O. Soffer, pp. 97–118. Unwin Hyman, London.
- Edwards, P.C. 1991 Wadi Hammeh 27: an Early Natufian site at Pella, Jordan. In *The Natufian Culture in the Levant*, edited by O. Bar-Yosef and F.R. Valla, pp. 123–148. International Monographs in Prehistory, Ann Arbor.
- Edwards, P.C., S.J. Bourke, S.M. Colledge, J. Head and P.G. Macumber 1988 Late Pleistocene prehistory in the Wadi el-Hammeh, Jordan valley. In *The Prehistory of Jordan. The State of Research in 1986*, edited by A.N. Garrard and H.-G. Gebel, pp. 525–565. BAR International Series 396, Oxford.
- Edwards, P.C., P.G. Macumber and M.J. Head 1996 The Early Epipalaeolithic of Wadi al-Hammeh. *Levant* 28:115–131.
- Eid, R.C. 1977 Detection and examination of anthrosols by phosphate analysis. *Science* 197:1327–1333.
- el-Eisawi, D. 1985 Vegetation in Jordan. In *Studies in the History and Archaeology of Jordan, vol. 2*, edited by A. Hadidi, pp. 67–78. Department of Antiquities of Jordan, Amman.
- Emeis, K.C., H.M. Schulz, U. Struck, T. Sakamoto, H. Doose, H. Erlenkeuser, M. Howell, D. Kroon and M. Paterne 1998 Stable isotope and alkenone temperature records of sapropels from sites 964 and 967: constraining the physical environment of sapropel formation in the eastern Mediterranean sea. In *Proceedings of the Ocean Drilling Program*, edited by A.E.S. Robertson, K.-C. Emeis, C. Richter and A. Camerlenghi, pp. 309–331. Ocean Drilling Program, Science Research 160.
- Emeis, K.C., U. Struck, H.M. Schulz, R. Rosenberg, S. Bernasconi, H. Erlenkeuser, T. Sakamoto and F. Martinez-Ruiz 2000 Temperature and salinity variations of Mediterranean sea surface waters over the last 160,000 years from records of planktonic stable oxygen isotopes and alkenone unsaturation

- ratios. *Palaeogeography, Palaeoclimatology, Palaeoecology* 158:259–280.
- Emery-Barbier, A. 1995 Pollen analysis: environmental and climatic implications. In *Prehistoric Cultural Ecology and Evolution: Insights from Southern Jordan*, edited by D.O. Henry, pp. 375–384. Plenum Press, New York.
- Enloe, J.G. 1993 Ethnoarchaeology of marrow cracking: implications for the recognition of prehistoric subsistence organization. In *From Bones to Behavior*, edited by J. Hudson, pp. 83–97. Centre for Archaeological Investigations. Southern Illinois University, Carbondale.
- Even, H., I. Carmi, M. Magaritz and R. Gerson 1986 Timing the transport of water through the upper vadose zone in a karstic system above a cave in Israel. *Earth surface process. Landforms* 11:181–191.
- Ewing, J.F. 1947 Preliminary note on the excavations at the Palaeolithic site of Ksar 'Akil, Republic of Lebanon. *Antiquity* 21:186–196.
- Ewing, J.F. 1949 Ksar Akil in 1948. *Biblica* 29:272–278.
- Fager, E.W. 1972 Diversity: a sampling study. *American Naturalist* 106:293–310.
- Fellner, R. 1995 *Cultural Change and the Epipalaeolithic of Palestine*. BAR International Series 599, Oxford.
- Ferring, C.R. 1976 Sde Divshon: an Upper Paleolithic site on the Divshon plain. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. I. The Avdat/Aqev Area, Part 1*, edited by A.E. Marks, pp. 99–206. SMU Press, Dallas.
- Ferring, C.R. 1977 The late Upper Paleolithic site of Ein Aqev East. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. II. The Avdat/Aqev Area, Part 2 and the Har Harif*, edited by A.E. Marks, pp. 81–118. Dept. of Anthropology, Southern Methodist University.
- Ferring, C.R. 1980 *Technological Variability and Change in the Late Paleolithic of the Negev*. University Microfilms International, Ann Arbor.
- Ferring, C.R. 1988 Technological change in the Upper Paleolithic of the Negev. In *Upper Pleistocene Prehistory of Western Eurasia*, edited by H.L. Dibble and A. Montet-White, pp. 333–348. University Museum, University of Pennsylvania, Philadelphia.
- Flannery, K.V. 1969 Origins and ecological effects of early domestication in Iran and the Near East. In *The Domestication and Exploitation of Plants and Animals*, edited by P.J. Ucko and G.W. Dimbleby, pp. 73–100. Duckworth, London.
- Flannery, K.V. 1986 *Gula Naquiz*. Academic Press, New York.
- Foley, R. and M. Mirazon Lahr 1997 Mode 3 technologies and the evolution of modern humans. *Cambridge Archaeological Journal* 7:3–36.
- Ford, J.A. 1952 Measurements of some prehistoric design developments in the southeastern States. *American Museum of National History, Anthropological Papers* 44:313–384.
- Fox, J.R. 2000 *The Rockshelter of Tor Sadaf: A Middle to Upper Paleolithic Transitional Site in the Wadi al-Hasa, West-Central Jordan*. Unpublished MA Thesis, Iowa State University.
- Fox, J.R. and N.R. Coinman 2000 *The Origins of the Levantine Upper Paleolithic: Evidence from the Tor Sadaf Rockshelter in the Wadi al-Hasa*. Paper presented at the 65th Annual Meeting of the SAA, Philadelphia.
- Frison, G. 1968 A functional analysis of certain chipped stone tools. *American Antiquity* 33:149–155.
- Frumkin, A., D.C. Ford and H.P. Schwarcz 1999 Continental oxygen isotope record in the last 170,000 years in Jerusalem. *Quaternary Research* 51:317–327.
- Galanidou, N. 1997 *Home Is Where the Hearth Is. The Spatial Organization of the Upper Palaeolithic Rockshelter Occupations at Klithi and Kastrisa in Northwest Greece*. BAR International Series 687, Oxford.
- Gamble, C. 1986 *The Palaeolithic Settlement of Europe*. Cambridge University Press, Cambridge.
- Gamble, C. 1993 *Timewalkers: The Prehistory of Global Colonization*. Harvard University Press, Cambridge MA.
- Garrard, A.N. 1980 *Man-Animal-Plant Relationships During the Upper Pleistocene and Early Holocene of the Levant*. Unpublished Ph.D. Thesis, Cambridge University, Cambridge.
- Garrard, A.N. 1982 The environmental implications of a reanalysis of the large mammal fauna from the Wadi el-Mughara caves, Palestine. In *Paleoclimates, Paleoenvironments and Human Communities in the Eastern Mediterranean Region in Later Prehistory*, edited by J. Bintliff and W. Van Zeist, pp. 165–187. BAR International Series 133, Oxford.
- Garrard, A.N. 1998 Environment and cultural adaptations in the Azraq basin: 24,000–7,000 BP. In *The Prehistoric Archaeology of Jordan*, edited by D.O. Henry, pp. 139–148. BAR International Series 705, Oxford.
- Garrard, A.N. (editor) in press *Beyond the Fertile Crescent. Epipalaeolithic and Neolithic Communities of the Jordanian Steppe, Volume 1*. Oxford University Press, Oxford.
- Garrard, A.N., D. Baird and B.F. Byrd 1994 The chronological basis and significance of the late Palaeolithic and Neolithic sequence in the Azraq basin, Jordan. In *Late Quaternary Chronology and Paleoclimates of the Eastern Mediterranean*, edited by O. Bar-Yosef and R.S. Kra, pp. 177–199. Radiocarbon, Tucson.
- Garrard, A.N., A.V.G. Betts, B.F. Byrd, S. Colledge and C. Hunt 1988a Summary of palaeoenvironmental and prehistoric investigations in the Azraq basin. In *The Prehistory of Jordan. The State of Research in 1986*, edited by A.N. Garrard and H.-G. Gebel, pp. 311–337. BAR International Series 396, Oxford.
- Garrard, A.N., A.V.G. Betts, B.F. Byrd and C. Hunt 1987 Prehistoric environment and settlement in the Azraq basin: an interim report on the 1985 excavation season. *Levant* 19:5–25.
- Garrard, A.N., B.F. Byrd and A.V.G. Betts. 1986 Prehistoric environment and settlement in the Azraq basin: an interim report on the 1984 excavation season. *Levant* 18:5–24.
- Garrard, A.N., B.F. Byrd, P. Harvey and F. Hivernel 1985 Prehistoric environment and settlement in the Azraq basin. A report on the 1982 survey season. *Levant* 17:1–28.
- Garrard, A.N., S. Colledge, C. Hunt and R. Montague 1988b Environment and subsistence during the Late Pleistocene and Early Holocene in the Azraq basin. *Paléorient* 14:40–49.
- Garrard, A.N., S. Colledge and L. Martin 1996 The emergence of crop cultivation and caprine herding in the “marginal zone” of the southern Levant. In *The Origins and Spread of Agriculture and Pastoralism in Eurasia*, edited by D.R. Harris, pp. 204–226. UCL Press, London.
- Garrod, D.A.E. 1938 The Upper Paleolithic in the Light of Recent Discovery. *Proceedings of the Prehistoric Society* 4:1–26.
- Garrod, D.A.E. 1951 A transitional industry from the base of the Upper Palaeolithic in Palestine and Syria. *Journal of the Royal Anthropological Institute* 81:121–132.
- Garrod, D.A.E. 1953 The Relations between South-West Asia and Europe in the Later Palaeolithic Age with Special Reference to the Origins of the Upper Palaeolithic Blade Cultures. *Journal of World History* 1:13–37.
- Garrod, D.A.E. 1954 Excavations at the Mugharet Kebara, Mount Carmel, 1931: the Aurignacian industries. *Proceedings of the Prehistoric Society* 20:155–192.
- Garrod, D.A.E. 1955 The Mugharet el-Emireh in lower Galilee: Type-Station of the Emiran Industry. *Journal of the Royal Anthropological Institute* 85:141–162.
- Garrod, D.A.E. 1957 Notes sur le Paléolithique supérieur du Moyen Orient. *Bulletin de la Société Préhistorique Française* 55:239–445.
- Garrod, D.A.E. and D.M.A. Bate 1937 *The Stone Age of Mount*

- Carmel. *Excavations at the Wadi-Mughara, vol. I*. Clarendon Press, Oxford.
- Gascoyne, M. 1983 Trace-element partition coefficients in the calcite-water system and their paleoclimatic significance in cave studies. *Journal of Hydrology* 61:213–222.
- Gascoyne, M. 1992 Paleoclimatic determination from cave calcite deposits. *Quaternary Science Review* 11:609–632.
- Généste, J.-M. 1985 *Analyse Lithique d'Industries Mousteriennes du Périgord: Une Approche Technologique du Comportement des Groupes Humains au Paléolithique Moyen*. Unpublished Ph.D. Thesis, Université de Bordeaux I, Bordeaux.
- Généste, J.M. 1988 Systèmes d'approvisionnement en matières premières au Paléolithique moyen et au Paléolithique supérieur en Aquitaine. In *L'Homme de Néanderthal, vol. 8. La Mutation*, edited by J.K. Kozłowski, pp. 61–70. ERAUL, Liège.
- Gibbons, A. 2000 Europeans trace ancestry to Paleolithic people. *Science* 290:1080–1081.
- Gifford-Gonzales, D. 1989 Ethnographic analogues for interpreting modified bones: some cases from east Africa. In *Bone Modification*, edited by R. Bonnichsen and M. Sorg, pp. 179–246. Center for the Study of the First Americans, University of Maine, Orno.
- Gilead, I. 1977 Lagama X. In *Prehistoric Investigations in Gebel Maghara, Northern Sinai*, edited by O. Bar-Yosef and J.L. Phillips, pp. 102–114. Qedem 7, Monographs of the Institute of Archaeology, Hebrew University Jerusalem.
- Gilead, I. 1981a Upper Palaeolithic tool assemblages from the Negev and Sinai. In *Préhistoire du Levant*, edited by P. Sanlaville and J. Cauvin, pp. 331–342. CNRS, Paris.
- Gilead, I. 1981b *Upper Palaeolithic in Sinai and the Negev: Sites in Gebel Maghara, Qadesh Barnea and Nahal Zin*. Unpublished Ph.D. Thesis, Hebrew University, Jerusalem.
- Gilead, I. 1983 Upper Palaeolithic occurrences in Sinai and the transition to the Epipalaeolithic in the southern Levant. *Paléorient* 9:39–53.
- Gilead, I. 1984a Is the term “Epipaleolithic” relevant to Levantine prehistory? *Current Anthropology* 25:227–229.
- Gilead, I. 1984b Palaeolithic sites in northeastern Sinai. *Paléorient* 10:135–142.
- Gilead, I. 1988 The Upper Palaeolithic to Epi-Palaeolithic transition in the Levant. *Paléorient* 14:177–182.
- Gilead, I. 1989 The Upper Paleolithic in the southern Levant: periodization and terminology. In *Investigations in South Levantine Prehistory*, edited by O. Bar-Yosef and B. Vandermeersch, pp. 231–254. BAR International Series 497, Oxford.
- Gilead, I. 1991 The Upper Paleolithic period in the Levant. *Journal of World Prehistory* 5:105–154.
- Gilead, I. 1993 Upper Palaeolithic sites in the Ramat Matred area. *Palestine Exploration Quarterly* 125:19–42.
- Gilead, I. 1995a The foragers of the Upper Paleolithic period. In *The Archaeology of Society in the Holy Land*, edited by T.E. Levy, pp. 124–140. Leicester University Press, London.
- Gilead, I. 1995b Problems and prospects in the study of Levallois technology in the Levant. The case of Fara II, Israel. In *The Definition and Interpretation of Levallois Technology*, edited by H.L. Dibble and O. Bar-Yosef, pp. 79–92. Prehistory Press, Madison.
- Gilead, I. and O. Bar-Yosef 1993 Early Upper Paleolithic sites in the Kadesh Barnea area, northeastern Sinai. *Journal of Field Archaeology* 20:265–280.
- Gilman, A. 1984 Explaining the Upper Palaeolithic revolution. In *Marxist Perspectives in Archaeology*, edited by M. Spriggs, pp. 115–126. Cambridge University Press, Cambridge.
- Ginter, B., J.K. Kozłowski, H. Laville, N. Sirakov and R.E.M. Hedges 1996 Transition in the Balkans: news from the Temnata cave, Bulgaria. In *The Last Neanderthals, the First Anatomically Modern Humans*, edited by E. Carbonell and M. Vaquero, pp. 169–200. Universitat Rovira i Virgili, Barcelona.
- Gisis, I. and I. Gilead 1977 Lagama III. In *Prehistoric Investigations in Gebel Maghara, Northern Sinai*, edited by O. Bar-Yosef and J.L. Phillips, pp. 85–101. Qedem 7, Monographs of the Institute of Archaeology, Hebrew University Jerusalem.
- Gladfelter, B.G. 1988 Late Pleistocene lakes within the mountains of southern Sinai: observations at the Tarfat oasis. *Bulletin de la Société de Géographie d'Égypte* LXI–LXII:29–49.
- Gladfelter, B.G. 1990 The geomorphic setting of Upper Paleolithic sites in Wadi el-Sheikh, southern Sinai. *Geoarchaeology* 5:99–119.
- Gladfelter, B.G. 1997 The Ahmari Tradition of the Levantine Upper Paleolithic: the environment of the archaeology. *Geoarchaeology* 12:363–393.
- Gladfelter, B.G. 2000 The geomorphic context of the Upper Paleolithic in Wadi Gayifa, northeastern Sinai. *Zeitschrift für Geomorphologie* 44:1–31.
- Goebel, T., M.R. Waters, I. Buvit, M.V. Konstantinov and A.V. Konstantinov 1999 Stenodonta-2 and the origins of microblade technologies in the Transbaikal, Siberia. *Antiquity* 74:567–575.
- Goldberg, P. 1981 Late Quaternary stratigraphy of Israel: an eclectic view. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, pp. 55–66. CNRS, Paris.
- Goldberg, P. 1983 The geology of Boker Tachtit, Boker, and their surroundings. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. III. The Avdat/Aqev Area, Part 3*, edited by A.E. Marks, pp. 39–62. Dept. of Anthropology, Southern Methodist University.
- Goldberg, P. 1986 Late Quaternary environmental history of the southern Levant. *Geoarchaeology* 1:225–244.
- Goldberg, P. 1994 Interpreting late Quaternary continental sequences in Israel. In *Late Quaternary Chronology and Paleoclimates of the Eastern Mediterranean*, edited by O. Bar-Yosef and R.S. Kra, pp. 89–102. Radiocarbon, Tucson.
- Goldberg, P. 1995 The changing landscape. In *The Archaeology of Society in the Holy Land*, edited by T.E. Levy, pp. 40–57. Leicester University Press, London.
- Goldberg, P. 1999 *Geoarchaeology in North America*. Paper presented at the 64th Annual Meeting of the SAA, Chicago.
- Goldberg, P. and O. Bar-Yosef 1998 Site formation processes in Kebara and Hayonim caves and their significance in Levantine prehistoric caves. In *Neanderthals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 107–125. Plenum, New York.
- Goldberg, P. and B. Brimmer 1983 Late Pleistocene geomorphic surfaces and environmental history of the Avdat/Aqev and Har Harif areas, Nahal Zin. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. III. The Avdat/Aqev Area, Part 3*, edited by A.E. Marks, pp. 1–14. Dept. of Anthropology, Southern Methodist University.
- Goldberg, P. and P. Laville 1991 Étude géologiques des dépôts de la grotte de Kébara (Mont-Carmel): campagnes 1982–1984. In *Le Squelette Moustérien de Kébara 2*, edited by O. Bar-Yosef and B. Vandermeersch, pp. 29–41. CNRS, Paris.
- Goldberg, P., D.T. Nash and M.D. Petraglia 1993 *Formation Processes in Archaeological Context*. Prehistory Press, Madison.
- Goldstone, J.A. in press Efflorescences and economic growth in world history: rethinking the ‘Rise of the West’ and the Industrial Revolution. *World History*.
- Goodfriend, G.A. 1999 Terrestrial stable isotope records of Late Quaternary paleoclimates in the eastern Mediterranean region. *Quaternary Science Review* 18:501–513.
- Goodfriend, G.A. and M. Magaritz 1988 Paleosols and Late

- Pleistocene rainfall fluctuations in the Negev Desert. *Nature* 6160:144–146.
- Goren, Y. and I. Gilead 1986 Quaternary environment and Man at Nahal Sekher, northern Negev. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 19:66*–79*.
- Goren-Inbar, N. 1988 Too small to be true? Re-evaluation of cores on flakes in Levantine Mousterian assemblages. *Lithic Technology* 17:37–44.
- Goren-Inbar, N. 1986 A figurine from the Acheulian site of Berekhat Ram. *Mitekufat Haeven* 19:7*–12*.
- Goren-Inbar, N. 1990 *Quneitra: A Mousterian Site on the Golan Heights*. Qedem 31. Monographs of the Institute of Archaeology, Hebrew University, Jerusalem.
- Goren-Inbar, N. and A. Belfer-Cohen 1998 The technological abilities of the Levantine Mousterians. In *Neandertals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 205–221. Plenum Press, New York.
- Goring-Morris, A.N. 1980a *Late Quaternary Sites in Wadi Fazaal, Lower Jordan Valley*. Unpublished MA Thesis, Hebrew University, Jerusalem.
- Goring-Morris, A.N. 1980b Upper Palaeolithic sites from Wadi Fazaal, lower Jordan valley. *Paléorient* 6:173–191.
- Goring-Morris, A.N. 1987 *At the Edge: Terminal Pleistocene Hunter-Gatherers in the Negev and Sinai*. BAR International Series 361, Oxford.
- Goring-Morris, A.N. 1988 Reply to reviews of “At the Edge”. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 21:79*–86*.
- Goring-Morris, A.N. 1989a Socio-cultural aspects of marine mollusc use in the terminal Pleistocene of the Negev and Sinai regions of the southern Levant. In *Proceedings of the 1986 Shell Bead Conference, Selected Papers*, edited by C.F. Hayes III, L. Ceci and C.C. Bodner, pp. 175–188. Rochester Museum of Science, Rochester, NY.
- Goring-Morris, A.N. 1989b Developments in terminal Pleistocene hunter-gatherer socio-cultural systems. A perspective from the Negev and Sinai Deserts. In *People and Culture in Change*, edited by I. Hershkovitz, pp. 7–28. BAR International Series 508, Oxford.
- Goring-Morris, A.N. 1995a Upper Palaeolithic occupation of the Ein Qadis area on the Sinai/Negev Border. *Atiqot* 27:1–14.
- Goring-Morris, A.N. 1995b Complex hunter-gatherers at the end of the Paleolithic (20,000–10,000 BP). In *The Archaeology of Society in the Holy Land*, edited by T.E. Levy, pp. 141–168. Leicester University Press, London.
- Goring-Morris, A.N. and A. Belfer-Cohen 1997 The articulation of cultural processes and late Quaternary environmental changes in Cisjordan. *Paléorient* 23:71–93.
- Goring-Morris, A.N. and P. Goldberg 1991 Late Quaternary dune incursions in the southern Levant: archaeology, chronology and palaeoenvironments. *Quaternary International* 5:115–137.
- Goring-Morris, A.N., O. Marder, A. Davidzon and F. Ibrahim 1998 Putting Humpty Dumpty together again: preliminary observations on refitting studies in the eastern Mediterranean. In *From Raw Material Procurement to Tool Production: The Organisation of Lithic Technology in Late Glacial and Early Postglacial Europe*, edited by S. Milliken, pp. 149–182. BAR International Series 700, Oxford.
- Goring-Morris, A.N. and S.A. Rosen 1989 An early Upper Palaeolithic assemblage with chamfered pieces from the central Negev, Israel. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 22:31*–40*.
- Gowlett, J. 1984 Mental abilities of early Man: a look at some hard evidence. In *Hominid Evolution and Community Ecology*, edited by R. Foley, pp. 167–192. Academic Press, London.
- Grayson, D.K. 1991 Alpine faunas from the White Mountain, California: adaptive change in the late prehistoric Great Basin. *Journal of Archaeological Science* 18:483–506.
- Haas, G. 1972 The microfauna of Djebel Qafzeh Cave. *Palaeo-vertebrata* 5:261–270.
- Haller, J. 1942–1943 Notes de préhistoire Phœnicienne. L’Abri de Abu-Halka (Tripoli). *Bulletin de Musée de Beyrouth* 6:1–20.
- Harmankaya, S. and O. Tanındı 1996 *Türkiye Arkeolojik Yerleşmeleri. 1, Paleolitik/Epipaleolitik*. Ege Yayınları. Istanbul.
- Harmon, R.S., H.P. Schwarcz and D.C. Ford 1978 Late Pleistocene paleoclimates of North America as inferred from stable isotope studies of speleothems. *Quaternary Research* 9:54–70.
- Harmon, R.S., H.P. Schwarcz and J.R. O’Neil 1979 D/H ratios in speleothem fluid inclusions: a guide to variations in the isotopic composition of meteoric precipitation? *Earth Planetary Science Letters* 42:254–266.
- Harpending, H., M. Batzer, M. Gurven, L. Jorde, A. Rogers and S. Sherry 1998 Genetic traces of ancient demography. *Proceedings of the National Academy of Science* 95:1961–1967.
- Harrold, F. 1978 *A Study of the Chatelperronian*. University Microfilms International, Ann Arbor.
- Harrold, F. 1989 Mousterian, Chatelperronian, and early Aurignacian in western Europe: continuity or discontinuity? In *The Human Revolution: Behavioural and Biological Perspectives in the Origins of Modern Humans*, edited by P. Mellars and C. Stringer, pp. 677–713. Edinburgh University Press, Edinburgh.
- Hassan, F.A. 1972 Toward a definition of “lames,” “lamelles,” and “microlamelles”. *Libyca* XX:163–167.
- Haudricourt, A.-G. 1987 *La Technologie Science Humaine: Recherches d’Histoire et d’Ethnologie des Techniques*. Éditions de la Maison des Sciences de l’Homme, Paris.
- Heinrich, H. 1988 Origin and consequences of cyclic ice rafting in the northeast Atlantic Ocean during the past 130,000 years. *Quaternary Research* 29:142–152.
- Hendy, C. 1971 The isotopic geochemistry of speleothems – I. The calculation of the effects of different modes of formation on the isotopic composition of speleothems and their applicability as paleoclimatic indicators. *Geochimica et Cosmochimica Acta* 35:801–824.
- Henry, D.O. 1973 *The Natufian of Palestine: its Material Culture and Ecology*. Unpublished Ph.D. Thesis, Southern Methodist University, Dallas.
- Henry, D.O. 1976 Rosh Zin: a Natufian Settlement near Ein Avdat. In *Prehistory and Paleoenvironments of the Central Negev Israel, vol. I. The Avdat/Aqev Area, Part 1*, edited by A.E. Marks, pp. 317–348. SMU Press, Dallas.
- Henry, D.O. 1979 Paleolithic sites within the Ras en-Naqb Basin, southern Jordan. *Palestine Exploration Quarterly* 3:79–85.
- Henry, D.O. 1982 The prehistory of southern Jordan and relationships with the Levant. *Journal of Field Archaeology* 9:417–444.
- Henry, D.O. 1986 The prehistory and palaeoenvironments of Jordan: an overview. *Paléorient* 12:5–26.
- Henry, D.O. 1988 Summary of prehistoric and paleoenvironmental research in the northern Hisma. In *The Prehistory of Jordan: The State of Research in 1986*, edited by A.N. Garrard and H.-G. Gebel, pp. 231–248. BAR International Series 396, Oxford.
- Henry, D.O. 1989a *From Foraging to Agriculture: the Levant at the End of the Ice Age*. University of Pennsylvania Press, Philadelphia.
- Henry, D.O. 1989b Correlations between reduction strategies and settlement patterns. In *Alternative Approaches to Lithic Analysis*, edited by D.O. Henry and G.H. Odell, pp. 139–156. AP3A, University of Tulsa, Tulsa.
- Henry, D.O. 1992 Transhumance during the late Levantine

- Mousterian. In *The Middle Paleolithic: Adaptation, Behavior, and Variability*, edited by H.L. Dibble and P. Mellars, pp. 143–162. University Museum, University of Pennsylvania, Philadelphia.
- Henry, D.O. 1994 Prehistoric cultural ecology in southern Jordan. *Science* 265:336–341.
- Henry, D.O. (editor) 1995a *Prehistoric Cultural Ecology and Evolution. Insights from Southern Jordan*. Plenum Press, New York.
- Henry, D.O. 1995b The influence of mobility levels on Levallouis point production, late Levantine Mousterian, southern Levant. In *The Definition and Interpretation of Levallouis Technology*, edited by H.L. Dibble and O. Bar-Yosef, pp. 185–200. Prehistory Press, Madison.
- Henry, D.O. 1995c The Qalkhan occupations. In *Prehistoric Cultural Ecology and Evolution: Insights from Southern Jordan*, edited by D.O. Henry, pp. 215–242. Plenum Press, New York.
- Henry, D.O. 1995d Late Levantine Mousterian patterns of adaptation and cognition. In *Prehistoric Cultural Ecology and Evolution: Insights from Southern Jordan*, edited by D.O. Henry, pp. 107–132. Plenum Press, New York.
- Henry, D.O. 1997 Cultural and geologic successions of Middle and Upper Paleolithic deposits in the Jebel Qalkha area of southern Jordan. In *The Prehistory of Jordan II: Perspectives from 1997*, edited by H.-G. Gebel, Z. Kafafi and G.O. Rollefson, pp. 69–76. SENEPSE 4, ex oriente, Berlin.
- Henry, D.O. 1998 The Middle Paleolithic of Jordan. In *The Prehistoric Archaeology of Jordan*, edited by D.O. Henry, pp. 23–38. BAR International Series 705, Oxford.
- Henry, D.O. and A.N. Garrard 1988 Tor Hamar: an Epipalaeolithic rockshelter in southern Jordan. *Palestine Exploration Quarterly* 120:1–24.
- Henry, D.O., S. Hall, H. Hietala, Y. Demidenko, V. Usik, A. Rosen and P. Thomas 1996 Middle Paleolithic behavioral organization: 1993 excavation of Tor Faraj, southern Jordan. *Journal of Field Archaeology* 23:31–53.
- Henry, D.O. and G.H. Odell (editors) 1989 *Alternative Approaches to Lithic Analysis*. AP3A, University of Tulsa, Tulsa.
- Henshilwood, C.S. and J. Sealy 1997 Bone artefacts from the Middle Stone Age at Blombos Cave, Southern Cape, South Africa. *Current Anthropology* 38:890–895.
- Henshilwood, C.S., J.C. Sealy, R. Yates, K. Cruz-Urube, P. Goldberg, F.E. Grine, R.G. Klein, C. Poggenpoel, K. van Niekerk and I. Watts 2001 Blombos Cave, southern Cape, South Africa: preliminary report on the 1992–1999 excavations of the Middle Stone Age levels. *Journal of Archaeological Science* 28:421–448.
- Hietala, H. 1983a Boker Tachtit: spatial distributions. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. III. The Avdat/Aqev Area, Part 3*, edited by A.E. Marks, pp. 191–216. Dept. of Anthropology, Southern Methodist University.
- Hietala, H. 1983b Boker Tachtit: intralevel and interlevel spatial analysis. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. III. The Avdat/Aqev Area, Part 3*, edited by A.E. Marks, pp. 217–281. Dept. of Anthropology, Southern Methodist University.
- Hietala, H. 1984 *Intrasite Spatial Analysis in Archaeology*. Cambridge University Press, Cambridge.
- Hietala, H. and A.E. Marks 1981 Changes in spatial organization at the Middle to Upper Paleolithic transitional site of Boker Tachtit, central Negev, Israel. In *Préhistoire du Levant*, edited by P. Sanlaville and J. Cauvin, pp. 305–318. CNRS, Lyon.
- Higgs, E.S. 1967 Faunal fluctuations and climate in Libya. In *Background to Evolution in Africa*, edited by W.W. Bishop and J.D. Clark, pp. 149–163. University of Chicago Press, Chicago.
- Hodder, I. 1977 Some new directions in the spatial analysis of the archaeological data at the regional scale (macro). In *Spatial Archaeology*, edited by D.L. Clarke, pp. 223–351. Academic Press, London.
- Hodder, I. 1979 Pottery distribution: service and tribal areas. In *Pottery and the Archaeologist*, edited by M. Millett, pp. 7–24. Institute of Archaeology, London.
- Hodder, I. and C. Orton 1976 *Spatial Analysis in Archaeology*. Cambridge University Press, Cambridge.
- Holmes, W.H. 1919 *Handbook of Aboriginal American Antiquities, Part I: Introduction, the Lithic Industries*. Bureau of American Ethnology, Washington D.C.
- Hooijer, D.A. 1961 The fossil vertebrates of Ksar 'Akil, a Palaeolithic rock shelter in Lebanon. *Zoologische Verhandlungen* 49:1–67.
- Horowitz, A. 1979 *The Quaternary of Israel*. Academic Press, New York.
- Horowitz, A. 1983 Boker Tachtit and Boker: the pollen record. In *Prehistory and Paleoenvironments of the Central Negev, Israel, vol. III. The Avdat/Aqev Area, Part 3*, edited by A.E. Marks, pp. 63–68. Dept. of Anthropology, Southern Methodist University.
- Horwitz, L.K., C. Cope and E. Tchernov 1990 Sexing the bones of mountain-gazelle (*Gazelle gazella*) from prehistoric sites in the southern Levant. *Paléorient* 16:1–12.
- Horwitz, L.K. and P. Goldberg 1989 A study of Pleistocene and Holocene hyaena coprolites. *Journal of Archaeological Science* 16:71–94.
- Horwitz, L.K. and E. Tchernov 1998 Diachronic and synchronic changes in patterns of animal exploitation during the Neolithic of the Southern Levant. In *Man and the Animal World. Studies in Archaeozoology, Archaeology, Anthropology and Palaeolinguistics in Memoriam Sándor Bökönyi*, edited by P. Anreiter, L. Bartosiewicz, E. Jerem and W. Meid, pp. 307–318. Archaeolingua, Budapest.
- Hou, Y., R. Potts, B. Yuan, Z. Guo, A. Deino, W. Wang, J. Clark, G. Xie and W. Huang 2000 Mid-Pleistocene Acheulean-like stone technology of the Bose basin, south China. *Science* 287:1622–1626.
- Hours, F. 1973 Le Kébarien au Liban: réflexions à partir des fouilles de Jiita en 1972. *Paléorient* 1:185–200.
- Hours, F. 1974 Remarques sur l'utilisation de listes-types pour l'étude de Paléolithique supérieur et de l'Epipaléolithique du Levant. *Paléorient* 2:3–18.
- Housley, R.A. 1994 Eastern Mediterranean chronology: the Oxford AMS contribution. In *Late Quaternary Chronology and Paleoclimates of the Eastern Mediterranean*, edited by O. Bar-Yosef and R.S. Kra, pp. 55–73. Radiocarbon, Tucson.
- Hovers, E. 1989 Settlement and subsistence patterns in the lower Jordan valley from Epipalaeolithic to Neolithic times. In *People and Culture in Change*, edited by I. Hershkovitz, pp. 37–51. BAR International Series 508, Oxford.
- Hovers, E. 1997 *Variability of Levantine Mousterian Assemblages and Settlement Patterns: Implications for Understanding the Development of Human Behaviour*. Unpublished Ph.D. Thesis, Hebrew University, Jerusalem.
- Hovers, E. 1998 The lithic assemblages of Amud Cave: implications for understanding the end of the Mousterian in the Levant. In *Neandertals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 143–163. Plenum, New York.
- Hovers, E. 2001 Territorial behavior in the Middle Paleolithic of the southern Levant. In *Settlement Dynamics of the Middle Paleolithic and Middle Stone Age*, edited by N. Conard, pp. 123–152. Kerns Verlag, Tübingen.
- Hovers, E., L.K. Horwitz, D.E. Bar-Yosef and C. Cope-Miyashiro 1988 The site of Urkan-E-Rub IIa: a case study of subsistence and mobility patterns in the Kebaran period in the lower Jordan

- valley. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 21:20–48.
- Hovers, E. and O. Marder 1991 Typo-chronology and absolute dating of the Kebaran Complex: implications from the second season of excavation at Urkan e-Rub IIa. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 24:34–58.
- Hovers, E., Y. Rak, R. Lavi and W.H. Kimbel 1995 Hominid remains from Amud cave in the context of the Levantine Middle Paleolithic. *Paléorient* 21:47–61.
- Hovers, E., B. Vandermeersch and O. Bar-Yosef 1997 A Middle Palaeolithic engraved artefact from Qafzeh Cave, Israel. *Rock Art Research* 14:79–87.
- Huang, W. and D. Wang 1995 La Recherche récente sur le Paléolithique ancien en Chine. *L'Anthropologie* 99:637–651.
- Hughes, T.P. 1987 The evolution of large technological systems. In *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, edited by W. Bijker, T. Hughes and T. Pinch, pp. 51–82. MIT Press, Cambridge.
- Imbrie, J., J.D. Hays, A. McIntyre, A.C. Mix, J.J. Morley, N.G. Pisias, W.L. Prell and N.G. Shackleton 1984 The orbital theory of Pleistocene climate: support from a revised chronology of the marine $\delta^{18}\text{O}$ record. In *Milankovich and Climate, Part 1*, edited by A. Berger, J. Imbrie, J. Hays, G. Kukla and B. Saltzman, pp. 269–305. Reidel, Boston.
- Ingold, T., D. Riches and J. Woodburn 1989 *Hunters and Gatherers 1: History, Evolution, and Social Change*. Berg, Oxford.
- Inizan, M.-L. and J.M. Gaillard 1978 Coquillages de Ksar 'Aqil: éléments de parure? *Paléorient* 4:295–306.
- Inizan, M.-L., M. Reduron-Ballinger, G. Roche and J. Tixier 1999 *Technology and Terminology of Knapped Stone*. Translated by J. Féblot-Augustins. Préhistoire de la Pierre Taillée, Tome 5. CREP, Nanterre.
- Jelinek, A.J. 1976 Form, function and style in lithic analysis. In *Cultural Change and Continuity: Essays in Honor of James Bennett Griffin*, edited by C. Cleland, pp. 19–33. Academic Press, New York.
- Jelinek, A.J. 1981a The Middle Palaeolithic in the southern Levant as seen from the perspective of the Tabun Cave, Mount Carmel (Israel). In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, pp. 265–280. CNRS, Paris.
- Jelinek, A.J. 1981b The Middle Paleolithic of the Levant: synthesis. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, pp. 299–302. CNRS, Paris.
- Jensen, H.J., R. Schild, F. Wendorf and A.E. Close 1991 Understanding the Late Palaeolithic tools with lustrous edges from the lower Nile valley. *Antiquity* 65:122–128.
- Jochim, M. 1983 Palaeolithic art in ecological perspective. In *Hunter-Gatherer Economy in Prehistory*, edited by G. Bailey, pp. 212–219. Cambridge University Press, Cambridge.
- Johnson, J.K., and C.A. Morrow (editors) 1987 *The Organization of Core Technology*. Westview Press, Boulder.
- Jones, K.T. 1993 The archaeological structure of a short-term camp. In *From Bones to Behavior*, edited by J. Hudson, pp. 101–114. Center for Archaeological Investigations, Southern Illinois University, Carbondale.
- Jones, M., A.E. Marks and D. Kaufman 1983 Boker: the artifacts. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. III. The Avdat/Aqev Area, Part 3*, edited by A.E. Marks, pp. 283–329. Dept. of Anthropology, Southern Methodist University.
- Jones, R. 1995 Tasmanian archaeology: establishing the sequences. *Annual Review of Anthropology* 24:423–446.
- Jones, S. 1997 *The Archaeology of Ethnicity: Constructing Identities in the Past and Present*. Routledge, London.
- Jouzel, J., N.I. Barkov, J.M. Barnola, M. Bender, J. Chappellaz, C. Genthon, V.M. Kotlyakov, V. Lipenkov, C. Lorius, J.R. Petit, D. Raynaud, G. Raisbeck, C. Ritz, T. Sowers, M. Stievenard, F. Yiou and P. Yiou 1993 Extending the Vostok ice-core record of palaeoclimate to the penultimate glacial record. *Nature* 364:407–412.
- Julig, P.J., D.G.F. Long, H.B. Schroeder, W.J. Rink, D. Richter and H.P. Schwarcz 1999 Geoarchaeology and new research at Jerf al-Ajla Cave, Syria. *Geoarchaeology* 14:821–848.
- Kallel, N., J.-C. Duplessy, L. Labeyrie, M. Fontugne, M. Paterne and M. Montacer 2000 Mediterranean pluvial periods and sapropel formation during the last 200,000 years. *Palaeogeography, Palaeoclimatology, Palaeoecology* 157:45–58.
- Kallel, N., M. Paterne, J.-C. Duplessy, C. Vergnaud-Grazzini, C. Pujol, L. Labeyrie, M. Arnold, M. Fontugne and C. Pierre 1997 Enhanced rainfall in the Mediterranean region during the last sapropel event. *Oceanologica Acta* 20:697–712.
- Karkanas, P., O. Bar-Yosef, P. Goldberg and S. Weiner 2000 Diagenesis in prehistoric caves: the use of minerals that form *in situ* to assess the completeness of the archaeological record. *Journal of Archaeological Science* 27:915–929.
- Karkanas, P., N. Kyparissi-Apostolika, O. Bar-Yosef and S. Weiner 1999 Mineral assemblages in Theopetra, Greece: a framework for understanding diagenesis in a prehistoric cave. *Journal of Archaeological Science* 26:1171–1180.
- Kaufman, A., G.J. Wasserburg, D. Porcelli, M. Bar-Matthews, A. Ayalon and L. Halicz 1998 U-Th isotope systematics from the Soreq cave, Israel and climatic correlations. *Earth and Planetary Science Letters* 156:141–155.
- Kaufman, D. 1981 *The Late Upper Paleolithic of the Levant: An Analysis of the Lithic Assemblages*. Unpublished Ph.D. Thesis, Southern Methodist University, Dallas.
- Kaufman, D. 1987 Interassemblage variability of metric attributes from lithic assemblages of the late Upper Paleolithic of Israel. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 20:37*–49*.
- Kaufman, D. 1988 Lithic assemblages and settlement patterns of the late Upper Paleolithic in Israel. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 21:7–19.
- Kaufman, D. 1992 Hunter-gatherers of the Levantine Epipalaeolithic: the socioecological origins of sedentism. *Journal of Mediterranean Archaeology* 5:165–201.
- Kaufman, D. 1998 Measuring archaeological diversity: an application of the jackknife technique. *American Antiquity* 63:73–85.
- Keeley, L.H. 1980 *Experimental Determination of Stone Tool Uses*. University of Chicago Press, Chicago.
- Keeley, L.H. 1982 Hafting and retooling: effects on the archaeological record. *American Antiquity* 47:789–809.
- Keeley, L.H. 1991 Tool use and spatial patterning: complications and solution. In *The Interpretation of Archaeological Spatial Patterning*, edited by E.M. Kroll and T.D. Price, pp. 257–268. Plenum Press, New York.
- Kelly, R.L. 1995 *The Foraging Spectrum: Diversity in Hunter-Gatherers Lifeways*. Smithsonian Institution Press, Washington, D.C.
- Kerry, K.W. 1997a *Lithic Analysis and Technotypologic Variability Concerning the Middle and Upper Paleolithic Assemblage of Jebel Humeima (J412), Southwest Jordan*. Unpublished MA Thesis, University of Tulsa, Tulsa.
- Kerry, K.W. 1997b Jebel Humeima: a preliminary analysis of an Ahmarian and Levantine Mousterian site in southwestern Jordan. In *The Prehistory of Jordan, II. Perspectives from 1997*, edited by H.-G. Gebel, Z. Kafafi and G.O. Rollefson, pp. 125–136. SENEPSE 4, ex oriente, Berlin.
- Kerry, K.W. 2000 Intra- and inter-site variability within the Levantine Upper Paleolithic: evidence from Jebel Humeima (J412), southwest Jordan. *Proceedings of the Prehistoric Society* 66:1–18.

- Kersten, A.M.P. 1989a Age and sex composition of Epipalaeolithic fallow deer and wild goat from Ksar 'Akil. *Palaeohistoria* 29:119–131.
- Kersten, A.M.P. 1989b The Epipalaeolithic ungulate remains from Ksar 'Akil: some preliminary results. In *Peoples and Cultures in Change*, edited by I. Hershkovitz, pp. 183–197. BAR International Series 508, Oxford.
- Kersten, A.M.P. 1991 Birds from the Palaeolithic rock shelter of Ksar 'Akil, Lebanon. *Paléorient* 17:99–116.
- Kersten, A.M.P. 1992 Rodent and insectivores from the Palaeolithic rock shelter of Ksar 'Akil (Lebanon) and their palaeoecological implications. *Paléorient* 18:27–45.
- Kislev, M.E., D. Nadel and I. Carmi 1992 Epipalaeolithic (19,000 BP) cereal and fruit diet at Ohalo II, Sea of Galilee, Israel. *Review of Palaeobotany and Palynology* 73:161–166.
- Klein, R.G. 1992 The archaeology of modern human origins. *Evolutionary Anthropology* 1:5–14.
- Klein, R.G. 1995a Anatomy, behavior, and modern human origins. *Journal of World Prehistory* 9:167–198.
- Klein, R.G. 1995b The Tor Hamar fauna. In *Prehistoric Cultural Ecology and Evolution. Insights from Southern Jordan*, edited by D.O. Henry, pp. 405–416. Plenum Press, New York.
- Klein, R.G. 1998 Why anatomically modern people did not disperse from Africa 100,000 years ago. In *Neandertals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 509–522. Plenum Press, New York.
- Klein, R.G. 1999 *The Human Career: Human Biological and Cultural Origins*. 2nd Edition, University of Chicago Press, Chicago.
- Klein, R.G. 2000 Archeology and the evolution of human behavior. *Evolutionary Anthropology* 9:17–36.
- Kluckhohn, C. 1936 Some reflections on the method and theory of Kulterkreislehre. *American Anthropologist* 38: 157–196.
- Knecht, H. 1991 Role of innovation in changing early Upper Palaeolithic organic projectile technologies. *Techniques et Culture* 17–18:115–144.
- Knecht, H. 1993 Early Upper Paleolithic approaches to bone and antler projectile technology. In *Hunting and Animal Exploitation in the Later Palaeolithic and Mesolithic of Eurasia*, edited by G.L. Peterkin, H.M. Bricker and P. Mellars, pp. 33–47. AP3A, Washington DC.
- Knecht, H. (editor) 1997 *Projectile Technology*. Plenum, New York.
- Koumouzelis, M., B. Ginter, J.K. Kozłowski, M. Pawlikowski, O. Bar-Yosef, R.M. Albert, M. Litynska-Zajac, E. Stworzewicz, P. Wojtal, G. Lipiecki, T. Tomek and Z.M. Bochenski 2001 The early Upper Palaeolithic in Greece: the excavations in Klisoura Cave. *Journal of Archaeological Science* 28:515–539.
- Kowalski, K. 1995 Lemmings (Mammalia, Rodentia) as indicators of temperature and humidity in the European Quaternary. *Acta Zoologica Cracove* 38:85–94.
- Kozłowski, J.K. 1988 L'apparition du Paléolithique supérieur. In *L'Homme de Néandertal, vol. 8: La Mutation*, edited by J.K. Kozłowski, pp. 11–21. ERAUL, Liège.
- Kozłowski, J.K. 1990 Certaines aspects techno-morphologiques des pointes foliacées de la fin du Paléolithique moyen au début du Paléolithique supérieur en Europe centrale. In *Paléolithique Moyen Récent et Paléolithique Supérieur Ancien en Europe*, edited by C. Farizy, pp. 125–134. CNRS, Paris.
- Kozłowski, J.K. 1992 The Balkans in the Middle and Upper Paleolithic: the gate to Europe or a cul-de-sac. *Proceedings of the Prehistoric Society* 58:1–20.
- Kozłowski, J.K. 1999 The evolution of the Balkan Aurignacian. In *Dorothy Garrod and the Progress of the Palaeolithic*, edited by W. Davies and R. Charles, pp. 97–117. Oxbow, Oxford.
- Kozłowski, J.K. 2000 The problem of cultural continuity between the Middle and the Upper Paleolithic in central and eastern Europe. In *The Geography of Neandertals and Modern Humans in Europe and the Greater Mediterranean*, edited by O. Bar Yosef and D. Pilbeam, pp. 77–105. Peabody Museum, Harvard University, Cambridge.
- Kozłowski, J.K. and B. Ginter 1982 *Excavation in the Bacho Kiro Cave (Bulgaria): Final Report*. Panstwowe Wydawnictwo Naukowe, Warszawa.
- Kozłowski, J.K. and M. Otte 2000 The formation of the Aurignacian in Europe. *Journal of Anthropological Research* 56:513–534.
- Kroeber, A.L. 1940 Stimulus diffusion. *American Anthropologist* 42:1–20.
- Kuhn, S.L. 1990 A geometric index of reduction for unifacial stone tools. *Journal of Archaeological Science* 17:583–593.
- Kuhn, S.L. 1991 "Unpacking" reduction: lithic raw material economy in the Mousterian of west-central Italy. *Journal of Anthropological Archaeology* 10:76–106.
- Kuhn, S.L. 1994 A formal approach to the design and assembly of mobile toolkits. *American Antiquity* 59:426–442.
- Kuhn, S.L. 1995 *Mousterian Lithic Technology: An Ecological Perspective*. Princeton University Press, Princeton.
- Kuhn, S.L. and M.C. Stiner 2001 The antiquity of hunter-gatherers. In *Hunter-Gatherers: An Interdisciplinary Perspective*, edited by C. Panter-Brick, R.H. Layton and P.A. Rowley-Conwy, pp. 99–142. Cambridge University Press, Cambridge.
- Kuhn, S.L., M.C. Stiner and E. Gulec 1999 Initial Upper Palaeolithic in south-central Turkey and its regional context: a preliminary report. *Antiquity* 73:505–517.
- Kuhn, S.L., M.C. Stiner, D.S. Reese and E. Gulec 2001 Ornaments in the earliest Upper Paleolithic: new insights from the Levant. *Proceedings of the National Academy of Sciences* 98:7641–7646.
- Kurten, B. 1965 The carnivora of the Palestine caves. *Acta Zoologica Fenn* 107:1–74.
- Landau, M. 1991 *Narratives of Human Evolution*. Yale University Press, New Haven.
- Landes, D.S. 1969 *Technological Change and Industrial Development in Western Europe from 1750 to the Present*. Cambridge University Press, Cambridge.
- Landes, D.S. 1998 *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor*. W.W. Norton, New York.
- Lanting, J.N. and J. van der Plicht 1995 14C-AMS: pros and cons for archaeology. *Palaeohistoria* 35–36:1–12.
- Larson, P.A. 1979 *Simulation Studies of Middle and Upper Paleolithic Settlement Patterns for the Southern Levant*. University Microfilms International, Ann Arbor.
- Larson, P.A. and A.E. Marks 1977 Two Upper Paleolithic sites in the Har Harif. In *Prehistory and Palaeoenvironments in the Central Negev, Israel, vol. II. The Avdat/Aqev Area, Part 2, and the Har Harif*, edited by A.E. Marks, pp. 173–190. Dept. of Anthropology, Southern Methodist University.
- Laville, H. and P. Goldberg 1989 The collapse of the Mousterian regime and the beginnings of the Upper Palaeolithic in Kebara Cave, Mount Carmel. In *Investigations in South Levantine Prehistory*, edited by O. Bar-Yosef and B. Vandermeersch, pp. 75–95. BAR International Series 497, Oxford.
- Laville, H., J.-P. Rigaud and J. Sackett 1980 *Rock Shelters of the Périgord: Geological Stratigraphy and Archaeological Succession*. Academic Press, New York.
- Lechtman, H. 1977 Style in technology – some early thoughts. In *Material Culture: Styles, Organization, and Dynamics of Technology*, edited by H. Lechtman and R. Merrill, pp. 3–20. West Publishing Co., St. Paul.
- Legge, A.J. and P.A. Rowley-Conwy 2000 The exploitation of animals. In *Village on the Euphrates. From Foraging to Farming at Abu Hureyra*, edited by A.M.T. Moore, G.C. Hillman and A.J. Legge, pp. 423–471. Oxford University Press, Oxford.

- Lehmann, U. 1970 Die tierreste aus den höhlen von Jabrud (Syrien). In *Fröhe Menschheit und Umwelt*, vol. 1, edited by K. Gripp, R. Schutrumf and H. Schwabedissen, pp. 181–188. Bohlau, Köln.
- Lemonnier, P. 1986 The study of material culture today: toward an anthropology of technical system. *Journal of Anthropological Archaeology* 5:147–186.
- Lemonnier, P. 1989 Bark capes, arrowheads and Concorde: on social representations of technology. In *The Meaning of Things*, edited by I. Hodder, pp. 156–169. Harper-Collins, London.
- Lemonnier, P. 1992 *Elements for an Anthropology of Technology*. Anthropological Papers No. 88, Museum of Anthropology, University of Michigan, Ann Arbor.
- Lemonnier, P. 1993 *Technological Choices. Transformation in Material Culture Since the Neolithic*. Routledge, London.
- Leroi-Gourhan, A. 1943 *Evolution et Techniques: L'Homme et la Matière*. A. Michel, Paris.
- Leroi-Gourhan, A. 1945 *Milieu et Techniques*. A. Michel, Paris.
- Leroi-Gourhan, A. 1964 *La Gestes et la Parole I – Technique et Langage*. A. Michel, Paris.
- Lévêque, F., A.M. Backer and M. Guilbaud (editors) 1993 *Context of a Late Neanderthal*. Prehistory Press, Madison.
- Lévêque, F. and B. Vandermeersch 1981 Un Néandertalien encombrant. *La Recherche* 122:644–645.
- Lieberman, D.E. 1993a *Mobility and Strain: The Biology of Cementogenesis and Its Application to the Evolution of Hunter-Gatherer Seasonal Mobility During the Late Quaternary in the Southern Levant*. Unpublished Ph.D. Thesis, Harvard University, Cambridge, MA.
- Lieberman, D.E. 1993b The rise and fall of seasonal mobility among hunter-gatherers: the case of the Southern Levant. *Current Anthropology* 34:599–632.
- Lieberman, D.E. 1995 Cementum increment analysis of teeth from Wadi Judayid (J2) and Tor Ahmar (J431): estimations of site seasonality. In *Prehistoric Cultural Ecology and Evolution. Insights from Southern Jordan*, edited by D.O. Henry, pp. 391–398. Plenum Press, New York.
- Lieberman, D.E. 1998 Neandertal and early modern human mobility patterns: comparing archaeological and anatomical evidence. In *Neandertals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 263–276. Plenum Press, New York.
- Lindly, J., R. Beck and G.A. Clark 2000 Core reconstruction and lithic reduction sequences at WHS 623X: an Upper Paleolithic site. In *The Archaeology of the Wadi al-Hasa, West-Central Jordan*, vol. 2: *Excavations at Middle, Upper and Epipaleolithic Sites*, edited by N.R. Coinman, pp. 211–226. Arizona State University, Tempe.
- Lindly, J. and G.A. Clark 1987 A preliminary lithic analysis of the Mousterian site of Ain Difla (WHS 634) in the Wadi Ali, west-central Jordan. *Proceedings of the Prehistoric Society* 53:279–292.
- Liphschitz, N. and Y. Waisel 1977 Appendix: dendroarchaeological Investigations in Israel: central Negev-Nahal Zin. In *Prehistory and Paleoenvironments in the Central Negev, Israel*, vol. II. *The Avdat/Aqev Area, Part 2 and the Har Harif*, edited by A.E. Marks, pp. 355–356. Dept. of Anthropology, Southern Methodist University.
- Liubin, V.P. 1989 *Palaeolithic of Caucasus*. Nauka, Leningrad.
- Longacre, W.A. 1981 Kalinga Pottery: an ethnoarchaeological study. In *Patterns of the Past: Studies in Honor of David Clarke*, edited by I. Hodder, G. Isaac and N. Hammond, pp. 49–66. Cambridge University Press, Cambridge.
- Lu, T.L.-D. 1998 The microblade tradition in China: regional chronologies and significance in the transition to Neolithic. *Asian Perspectives* 37:84–112.
- Lucas, G. 1997 Les lamelles Dufour du Flageolet I (Bezenac, Dordogne) dans le contexte Aurignacien. *Paléo* 9:191–219.
- MacDonald, B. (editor) 1988 *The Wadi el Hasa Archaeological Survey 1979–1983, West-Central, Jordan*. Wilfred Laurier University Press, Waterloo.
- MacDonald, B., E.B. Banning and L.A. Pavlish 1980 The Wadi al-Hasa survey 1979: a preliminary report. *Annual of the Department of Antiquities of Jordan* 24:169–183.
- MacDonald, B., G.O. Rollefson, E.B. Banning, B.F. Byrd and C. D'Annibale 1983 The Wadi al-Hasa survey 1982: a preliminary report. *Annual of the Department of Antiquities of Jordan* 27:311–323.
- MacDonald, B., G.O. Rollefson and D.U. Roller 1982 The Wadi al-Hasa survey 1981: a preliminary report. *Annual of the Department of Antiquities of Jordan* 26:117–131.
- MacKenzie, D.A. 1996 *Knowing Machines: Essays on Technical Change*. MIT Press, Cambridge, MA.
- MacNeish, R.C. 1996 A Paleolithic-Neolithic sequence from south China Jiangxi Province, PRC. *Interdisciplinary Perspectives on the Origins of the Japanese, International Symposium 1996*:233–255.
- Macphail, R.I. and P. Goldberg 1995 Recent advances in micromorphological interpretations of soils and sediments from archaeological sites. In *Archaeological Sediments and Soils: Analysis, Interpretation and Management*, edited by T. Barham and R.I. Macphail, pp. 1–24e. Institute of Archaeology, UCL, London.
- Macphail, R.I., P. Goldberg and M.-A. Courty 1990 Soils and micromorphology in archaeology. *Endeavour* 14:163–171.
- Macphail, R.I. and P. Goldberg 2000 Geoarchaeological investigation of sediments from Gorham's and Vanguard Caves, Gibraltar: microstratigraphical (soil, micromorphological and chemical) signatures. In *Neanderthals on the Edge*, edited by C.B. Stringer, R.N.E. Barton and J.C. Finlayson, pp. 183–200. Oxbow, Oxford.
- Madariaga, B. 1966 Fauna malacologica. In *Excavaciones en la Terraza de "El Khiam" (Jordania)*, vol 2, edited by J.G. Echegaray, pp. 165–171. Bibliotheca Praehistorica Hispania V, Madrid.
- Magaritz, M. 1986 Environmental changes recorded in the upper Pleistocene along the desert boundary, southern Israel. *Palaeogeography, Palaeoclimatology, Palaeoecology* 53: 213–229.
- Magaritz, M. and G.A. Goodfriend 1987 Movement of the desert boundary in the Levant from latest Pleistocene to early Holocene. In *Abrupt Climatic Changes: Evidence and Implications*, edited by W.H. Berger and L.D. Labeyrie, pp. 173–184. D. Reidel Publishing Company, Dordrecht.
- Magaritz, M. and A. Kaufman 1983 Paleoclimate in desert region. *American Scientist* 71:514–521.
- Magurran, A.E. 1998 *Ecological Diversity and Its Measurement*. Princeton University Press, Princeton.
- Marder, O. 1994 *Technological Aspects of Lithic Industries of Epipalaeolithic Entities in the Levant. Chaîne Opératoire in the Ramonian of the Negev*. Unpublished MA Thesis, Hebrew University, Jerusalem (Hebrew).
- Marks, A.E. 1968a The Mousterian industries of Nubia. In *Prehistory of Nubia*, vol. 1, edited by F. Wendorf, pp. 194–314. Fort Worth Research Center and SMU Press, Dallas.
- Marks, A.E. 1968b The Khormusan: an upper Pleistocene industry in Sudanese Nubia. In *Prehistory of Nubia*, vol. 1, edited by F. Wendorf, pp. 315–391. Fort Worth Research Center and SMU Press, Dallas.
- Marks, A.E. 1975 The current status of Upper Palaeolithic studies from the Maghreb to the northern Levant. In *Problems in Prehistory*, edited by F. Wendorf and A.E. Marks, pp. 439–457. SMU Press, Dallas.
- Marks, A.E. (editor) 1976a *Prehistory and Paleoenvironments in*

- the Central Negev, Israel, vol. I. *The Avdat/Agev Area, Part 1*. SMU Press, Dallas.
- Marks, A.E. 1976b Ein Aqev: a late Levantine Upper Palaeolithic site in the Nahal Aqev. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. I. The Avdat/Agev Area, Part 1*, edited by A.E. Marks, pp. 227–292. SMU Press, Dallas.
- Marks, A.E. 1976c Glossary. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. I. The Avdat/Agev Area, Part 1*, edited by A.E. Marks, pp. 371–383. SMU Press, Dallas.
- Marks, A.E. 1976d Terminology and chronology of the Levantine Upper Palaeolithic as seen from the central Negev, Israel. In *Deuxième Colloque sur la Terminologie de la Préhistoire du Proche-Orient*, edited by F. Wendorf, pp. 49–76. 9th Congress, UISPP, Nice.
- Marks, A.E. 1976e Site D5: a Geometric Kebaran “A” occupation in the Nahal Zin. In *Prehistory and Paleoenvironments of the Central Negev, Israel, vol. I. The Avdat/Agev Area, Part 1*, edited by A.E. Marks, pp. 293–315. SMU Press, Dallas.
- Marks, A.E. (editor) 1977a *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. II. The Avdat/Agev Area, Part 2, and the Har Harif*. Department of Anthropology, Southern Methodist University.
- Marks, A.E. 1977b Introduction: a preliminary overview of central Negev prehistory. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. II. The Avdat/Agev Area, Part 2 and the Har Harif*, edited by A.E. Marks, pp. 3–34. Department of Anthropology, Southern Methodist University.
- Marks, A.E. 1977c The Upper Paleolithic sites of Boker Tachtit and Boker: a preliminary report. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. II. The Avdat/Agev Area, Part 2, and the Har Harif*, edited by A.E. Marks, pp. 61–79. Department of Anthropology, Southern Methodist University.
- Marks, A.E. 1981a The Upper Paleolithic of the Negev. In *Préhistoire du Levant*, edited by P. Sanlaville and J. Cauvin, pp. 343–352. CNRS, Paris.
- Marks, A.E. 1981b The Upper Paleolithic of the Levant. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, pp. 369–374. CNRS, Paris.
- Marks, A.E. 1981c The Middle Paleolithic of the Negev, Israel. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, pp. 287–298. CNRS, Paris.
- Marks, A.E. (editor) 1983a *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. III. The Avdat/Agev Area, Part 3*. Department of Anthropology, Southern Methodist University.
- Marks, A.E. 1983b The sites of Boqer Tachtit and Boqer: a brief introduction. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. III. The Avdat/Agev Area, Part 3*, edited by A.E. Marks, pp. 15–37. Department of Anthropology, Southern Methodist University.
- Marks, A.E. 1983c The Middle to Upper Paleolithic transition in the Levant. In *Advances in World Archaeology, vol. II*, edited by F. Wendorf and A.E. Close, pp. 51–98. Academic Press, New York.
- Marks, A.E. 1988 At the edge or over It? A critique of Goring-Morris’s construct for Upper Paleolithic development. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 21:59–67.
- Marks, A.E. 1990 The Upper and Middle Paleolithic of the Near East and the Nile valley: the problem of cultural transformations. In *The Emergence of Modern Humans: An Archaeological Perspective*, edited by P. Mellars, pp. 56–80. University of Edinburgh Press, Edinburgh.
- Marks, A.E. 1992 Upper Pleistocene archaeology and the origins of modern Man: a view from the Levant and adjacent areas. In *The Evolution and Dispersal of Modern Humans in Asia*, edited by T. Akazawa, K. Aoki and T. Kimura, pp. 229–251. Hokusensha Press, Tokyo.
- Marks, A.E. 1993 The early Upper Paleolithic: the view from the Levant. In *Before Lascaux: The Complex Record of the Early Upper Paleolithic*, edited by H. Knecht, A. Pike-Tay and R. White, pp. 5–21. CRC Press, London.
- Marks, A.E. 1997 Commentaires sur l’article de H. Plisson et S. Beyries ‘pointes ou outils triangulaire? Données fonctionnelles dans le Mousterien Levantin’. *Paléorient* 24:18–20.
- Marks, A.E. and C.R. Ferring 1976 Upper Paleolithic sites near Ein Avdat. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. I. The Avdat/Agev Area, Part 1*, edited by A.E. Marks, pp. 141–198. SMU Press, Dallas.
- Marks, A.E. and C.R. Ferring 1977 Upper Paleolithic occupation near ‘Avdat, central Negev, Israel. *Eretz Israel* 13:191–208.
- Marks, A.E. and C.R. Ferring 1988 The early Upper Paleolithic of the Levant. In *The Early Upper Paleolithic: Evidence from Europe and the Near East*, edited by J.F. Hoffecker and C.A. Wolf, pp. 43–72. BAR International Series 437, Oxford.
- Marks, A.E. and D.A. Friedel 1977 Prehistoric settlement patterns in the Avdat/Agev area. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. II. The Avdat/Agev Area, Part 2, and the Har Harif*, edited by A.E. Marks, pp. 131–158. Dept. of Anthropology, Southern Methodist University.
- Marks, A.E., H.J. Hietala and J.K. Williams 2001 Tool standardization in the Middle and Upper Paleolithic: a closer look. *Cambridge Archaeological Journal* 11:17–44.
- Marks, A.E. and D. Kaufman 1983 Boqer Tachtit: the artifacts. In *Prehistory and Paleoenvironments in the Negev, vol. III. The Avdat/Agev Area, Part 3*, edited by A.E. Marks, pp. 69–125. Dept. of Anthropology, Southern Methodist University.
- Marks, A.E. and P.A. Larson 1977 Test excavations at the Natufian site of Rosh Horesha. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. II. The Avdat/Agev Area, Part 2, and the Har Harif*, edited by A.E. Marks, pp. 191–232. Dept. of Anthropology, Southern Methodist University.
- Marks, A.E. and K. Monigal 1995 Modeling the production of elongated blanks from the early Levantine Mousterian at Rosh Ein Mor. In *The Definition and Interpretation of Levallois Technology*, edited by H.L. Dibble and O. Bar-Yosef, pp. 267–278. Prehistory Press, Madison.
- Marks, A.E. and A.H. Simmons 1977 The Negev Kebaran of the Har Harif. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. II. The Avdat/Agev Area, Part 2 and the Har Harif*, edited by A.E. Marks, pp. 233–270. Dept. of Anthropology, Southern Methodist University.
- Marks, A.E. and P. Volkman 1983 Changing core reduction strategies: a technological shift from the Middle to the Upper Paleolithic in the southern Levant. In *The Mousterian Legacy: Human Biocultural Change in the Upper Pleistocene*, edited by E. Trinkaus, pp. 13–34. BAR International Series 164, Oxford.
- Marshack, A. 1997 Paleolithic image making and symboling in Europe and the Middle East: a comparative review. In *Beyond Art: Pleistocene Image and Symbol*, edited by M.W. Conkey, O. Soffer, D. Stratmann and N.G. Jablonski, pp. 53–91. Memoirs of the California Academy of Sciences, San Francisco.
- Marshall, F. 1994 Food sharing and body part representation in Okiek faunal assemblages. *Journal of Archaeological Science* 21:65–77.
- Martin, L.A. 1994 *Hunting and Herding in a Semi-Arid Region*. Unpublished Ph.D. Thesis, University of Sheffield, Sheffield.
- Martin, L.A. 1998 The animal bones. In *The Harra and the Hamad. Excavations and Surveys in Eastern Jordan, vol. 1*, edited by A.V.G. Betts, pp. 159–184. Sheffield Academic Press, Sheffield.
- Martin, L.A. 1999 Mammal remains from the eastern Jordanian

- Neolithic, and the nature of caprine herding in the steppe. *Paléorient* 25:87–104.
- Martinson, D.G., N. Pisias, J.D. Hays, J. Imbrie, T.C. Moore Jr. and N.J. Shackleton 1987 Age dating and the orbital theory of the ice ages: development of a high-resolution 0 to 300,000-year chronostratigraphy. *Quaternary Research* 27:1–29.
- Mathews, A., A. Ayalon and M. Bar-Matthews 2000 D/H ratios of fluid inclusions of Soreq Cave (Israel) speleothems as a guide to the eastern Mediterranean meteoric line relationships in the last 120 ky. *Chemical Geology* 166:183–191.
- Mathews, W. 1995 Micromorphological characterisation and interpretation of occupation deposits and microstratigraphic sequences at Abu Salabikh, Iraq. In *Archaeological Sediments and Soils, Analysis, Interpretation and Management*, edited by T. Barham, M. Bates and R.I. Macphail, pp. 41–76. Archetype Books, London.
- Mathews, W., C.A.I. French, T. Lawrence, D.F. Cutler and M.K. Jones 1996 Multiple surfaces: the micromorphology. In *On the Surface: Çatalhöyük 1993–1995*, edited by I. Hodder, pp. 301–342. The McDonald Institute for Research and British Institute of Archaeology at Ankara, Cambridge.
- Mathews, W., C.A.I. French, T. Lawrence, D.F. Cutler and M.K. Jones 1997 Microstratigraphic traces of site formation processes and human activities. *World Archaeology* 29:281–308.
- Mauldin, R. and D. Amick 1989 Investigating patterning in debitage from experimental bifacial core reduction. In *Experiments in Lithic Technology*, edited by D. Amick and R. Mauldin, pp. 67–88. BAR International Series 528, Oxford.
- Mauss, M. 1936 Les techniques du corps. *Journal de Psychologie* 32:271–293.
- May, R.M. 1981 Patterns in multi-species communities. In *Theoretical Ecology: Patterns and Applications*, edited by R.M. May, pp. 197–227. Sinauer Associates, Sunderland.
- McBrearty, S. and A.S. Brooks 2000 The revolution that wasn't: a new interpretation of the origin of modern human behavior. *Journal of Human Evolution* 39:453–563.
- McBurney, C.B.M. 1967 *The Haua Fteah (Cyrenaica) and the Stone Age of the Southeast Mediterranean*. Cambridge University Press, Cambridge.
- McBurney, C.B.M. 1975 Current status of the Lower and Middle Paleolithic of the entire region from the Levant through North Africa. In *Problems in Prehistory*, edited by F. Wendorf and A. E. Marks, pp. 411–425. SMU Press, Dallas.
- Meignen, L. 1994 Le Paléolithique moyen au Proche Orient: le phénomène laminaire. In *Les Industries Laminaires au Paléolithique Moyen*, edited by S. Révillion and A. Tuffreau, pp. 125–160. CNRS, Paris.
- Meignen, L. 1995 Levallois lithic production systems in the Middle Paleolithic of the Near East: the case of the unidirectional method. In *The Definition and Interpretation of Levallois Technology*, edited by H.L. Dibble and O. Bar-Yosef, pp. 361–380. Prehistory Press, Madison.
- Meignen, L. 1998a Hayonim Cave lithic assemblages in the context of the Near Eastern Middle Paleolithic. In *Neandertals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 165–180. Plenum Press, New York.
- Meignen, L. 1998b Le Paléolithique moyen au Levant sud et central: que nous apprennent les données récentes? In *Préhistoire d'Anatolie: Genèse de Deux Mondes*, edited by M. Otte, pp. 685–708. ERAUL, Liège.
- Meignen, L. 2000 Early Middle Palaeolithic blade technology in southwestern Asia. *Acta Anthropologica Sinica* (Supplement) 19:158–168.
- Meignen, L. and O. Bar-Yosef 1988 Variabilité technologique au Proche Orient: l'exemple de Kebara. In *L'Homme de Néandertal, vol. 4: La Technique*, edited by M. Otte, pp. 81–95. ERAUL, Liège.
- Meignen, L. and O. Bar-Yosef 1991 Les outillages lithiques Moustériens de Kébara (fouilles 1982–85). In *Une Squelette Moustérienne de Kébara 2*, edited by O. Bar-Yosef and B. Vandermeersch, pp. 49–76. CNRS, Paris.
- Meignen, L., O. Bar-Yosef, P. Goldberg and S. Weiner 2001 Le feu au Paléolithique moyen: recherches sur les structures de combustion et le status des foyers. L'exemple de Proche Orient. *Paléorient* 26:9–22.
- Meignen, L., S. Beyries, J.D. Speth and O. Bar-Yosef 1998 Acquisition, traitement des matières animales et fonction du site au Paléolithique Moyen dans la grotte de Kébara (Israël): approche interdisciplinaire. In *Economie Préhistorique: Les Comportements de Subsistance au Paléolithique*, edited by J.-P. Brugal, L. Meignen and M. Patou-Matis, pp. 227–242. Éditions APDCA, Sophia Antipolis.
- Melkhi, E. in preparation *Les Industries Epipaléolithiques de Jiita (Liban)*. PhD Thesis, Université de Lyon – Lumière II, Lyon.
- Mellars, P. 1969 The chronology of Mousterian industries in the Périgord region of south-west France. *Proceedings of the Prehistoric Society* 35:134–171.
- Mellars, P. 1989 Major issues in the emergence of modern humans. *Current Anthropology* 30:349–385.
- Mellars, P. 1996a *The Neanderthal Legacy: An Archaeological Perspective from Western Europe*. Princeton University Press, Princeton.
- Mellars, P. 1996b Symbolism, language, and the Neanderthal mind. In *Modelling the Early Human Mind*, edited by P. Mellars and K. Gibson, pp. 15–32. McDonald Institute of Archaeological Research, Cambridge.
- Mellars, P., M. Otte, L.G. Straus, J. Zilhao and F. d'Errico 1999 The Neanderthal problem continued. *Current Anthropology* 40:341–364.
- Mellars, P. and C. Stringer (editors) 1989 *The Human Revolution: Behavioural and Biological Perspectives in the Origins of Modern Humans*. Edinburgh University Press, Edinburgh.
- Mellars, P. and J. Tixier 1989 Radiocarbon-accelerator dating of Ksar Akil (Lebanon) and the chronology of the Upper Palaeolithic sequence in the Middle East. *Antiquity* 63:761–768.
- Meshveliani, T., O. Bar-Yosef and A. Belfer-Cohen in press The Upper Palaeolithic in western Georgia. In *Another World: The Early Upper Paleolithic East of the Danube*, edited by P.J. Brantingham, K.W. Kerry and S.L. Kuhn.
- Middleton, W.D. and T.D. Price 1996 Identification of activity areas by multi-element characterization of sediments from modern archaeological house floors using inductively coupled plasma-atomic emission spectroscopy. *Journal of Archaeological Science* 23:673–687.
- Mills, M.G.L. 1990 *Kalahari Hyaenas*. Unwin Hyman, London.
- Mintz, S. 1985 *Sweetness and Power: The Place of Sugar in Modern History*. Sifton, New York.
- Minzoni-Deroche, A. 1992 Üçağızlı Mağra, un site Aurignacien dans le Hatay (Anatolie). Premiers résultats. *Paléorient* 18:89–96.
- Minzoni-Deroche, A., M. Menuet and P. Walker 1995 The working of pigment during the Aurignacian period: evidence from Üçağızlı Cave (Turkey). *Antiquity* 69:153–158.
- Mithen, S. 1995 Palaeolithic archaeology and the evolution of mind. *Journal of Archaeological Research* 3:305–332.
- Mithen, S. 1996 *The Prehistory of the Mind. A Search for the Origins of Art, Religion and Science*. Thames and Hudson, London.
- Moloney, N. 1998 Ochre and incised flint from Ras el-Kelb. In *The Mousterian Site of Ras el-Kelb, Lebanon*, edited by L. Copeland and N. Moloney, pp. 181–185. BAR International Series 706, Oxford.
- Molist, M., and M.-C. Cauvin 1990 Une nouvelle sequence

- stratifiée pour la préhistoire en Syrie semi-désertique. *Paléorient* 16:55–63.
- Monigal, K. 2001 Leptolithic Lower and Middle Paleolithic industries and the dawn of the Upper Paleolithic in the Levant. *Archaeology, Anthropology, and Ethnology of Eurasia* 1:11–24.
- Moore, F.W. (editor) 1961 *Readings in Cross-Cultural Methodology*. Human Relations Area Files Press, New Haven.
- Moss, E.H. 1983 A microwear analysis of burins and points from Tell Abu Hureyra, Syria. In *Traces d'Utilisation sur les Outils Néolithiques du Proche Orient*, edited by D. Stordeur, pp. 143–161. CNRS, Lyon.
- Mourer-Chuaviré, C. 1983 Les oiseaux dans les habitat Paléolithiques: gibier des hommes ou proies des rapaces? In *Animals and Archaeology: 2. Shell Middens, Fishes and Birds*, edited by C. Grigson and J. Clutton-Brock, pp. 111–124. BAR International Series 183, Oxford.
- Movius, H., N. David, H. Bricker and B. Clay 1968 *The Analysis of Certain Major Classes of Upper Palaeolithic Tools*. Peabody Museum, Harvard University, Cambridge.
- Muheisen, M. 1988 A survey of prehistoric sites in the Jordan valley (1985). In *The Prehistory of Jordan: The State of Research in 1986*, edited by A.N. Garrard and H.-G. Gebel, pp. 503–523. BAR International Series 396, Oxford.
- Munday, F.C. 1976 The Avdat/Aqev area: its habitat and geographic setting. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. I. The Avdat/Aqev Area, Part 1*, edited by A.E. Marks, pp. 9–24. SMU Press, Dallas.
- Munday, F.C. 1977 Nahal Aqev (D35): a stratified, open-air Mousterian occupation in the Avdat/Aqev area. In *Prehistory and Paleoenvironments of the Central Negev, Israel, vol. II. The Avdat/Aqev Area, Part 2 and the Har Harif*, edited by A.E. Marks, pp. 35–60. Dept. of Anthropology, Southern Methodist University.
- Nadel, D. 1991 Ohalo II – The third season. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 24:158–163.
- Nadel, D. 1993 Submerged archaeological sites on the shores of Lake Kinneret, Israel. *Atiqot* 22:1–12.
- Nadel, D. 1994 Levantine Upper Palaeolithic – early Epipalaeolithic burial customs: Ohalo II as a case study. *Paléorient* 20:113–121.
- Nadel, D. 1995 The visibility of prehistoric burials in the southern Levant. How rare are the Upper Palaeolithic/early Epipalaeolithic graves? In *The Archaeology of Death in the Ancient Near East*, edited by S. Campbell and A. Green, pp. 1–8. Oxbow, Oxford.
- Nadel, D. 1996 The organization of space in a fisher-hunter-gatherers camp at Ohalo II, Israel. In *Nature at Culture*, edited by M. Otte, pp. 373–388. ERAUL, Liège.
- Nadel, D. 1997a *The Spatial Organization of Prehistoric Sites in the Jordan Valley: Kebaran, Natufian and Neolithic Case Studies*. Unpublished Ph.D. Thesis, Hebrew University, Jerusalem (Hebrew).
- Nadel, D. 1997b Book review of R.O. Fellner, 'Cultural Change and the Epipalaeolithic of Palestine' (1995). *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 27:121–128.
- Nadel, D. 1999 The scalene triangles from Ohalo II. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 29:5–16.
- Nadel, D. 2000 Brush hut floors, hearths and flints: the Ohalo II case study (19ka, Jordan Valley, Israel). *Journal of Human Evolution* 38:A22–23.
- Nadel, D., I. Carmi and D. Segal 1995 Radiocarbon dating of Ohalo II: archaeological and methodological implications. *Journal of Archaeological Science* 22:811–822.
- Nadel, D., A. Danin, E. Werker, T. Schick, M.E. Kislev and K. Stewart 1994 19,000 years-old twisted fibres from Ohalo II. *Current Anthropology* 35:451–458.
- Nadel, D. and I. Hershkovitz 1991 New subsistence data and human remains from the earliest Epipalaeolithic in Israel. *Current Anthropology* 32:631–635.
- Nadel, D. and E. Werker 1999 The oldest ever brush hut plant remains from Ohalo II, Jordan Valley, Israel (19,000 BP). *Antiquity* 73:755–764.
- Needham, J. 1954–84 *Science and Civilization in China*. Cambridge University Press, Cambridge.
- Neeley, M.P. and M. Barton 1994 A new approach to interpreting Late Pleistocene microlith assemblages in southwest Asia. *Antiquity* 68:275–288.
- Neeley, M.P., J.D. Peterson, G.A. Clark and S.K. Fish 2000 WHS 1065 (Tor al-Tareeq): an Epipalaeolithic site in the Wadi al-Hasa, west-central Jordan. In *The Archaeology of the Wadi al-Hasa, West-Central Jordan, vol. 2. Excavations at Middle, Upper, and Epipalaeolithic Sites*, edited by N.R. Coinman, pp. 245–279. Arizona State University, Tempe.
- Neeley, M.P., J.D. Peterson, G.A. Clark, S.K. Fish, and M. Glass 1998 Investigations at Tor al-Tareeq: an Epipalaeolithic site in the Wadi Hasa, Jordan. *Journal of Field Archaeology* 25:295–317.
- Neuville, R. 1934 Le préhistorique de Palestine. *Revue Biblique* 43:237–259.
- Neuville, R. 1951 *Le Paléolithique et le Mésolithique du Desert de Judée*, Mémoire no. 24. Archives de l'Institut de Paléontologie Humaine, Paris.
- Newcomer, M.H. 1971 Some quantitative experiments in hand-axe manufacture. *World Archaeology* 3:85–94.
- Newcomer, M.H. 1972 *An Analysis of a Series of Burins from Ksar Akil, (Lebanon)*. Unpublished Ph.D. Thesis, UCL, London.
- Newcomer, M.H. 1974 Study and replication of bone tools from Ksar Akil (Lebanon). *World Archaeology* 6: 138–153.
- Newcomer, M.H. 1987 Appendix 3: study and replication of bone Tools from Ksar Akil (Lebanon). In *Ksar Akil, Lebanon: A Technological and Typological Analysis of the Later Upper Palaeolithic Levels*, edited by C.A. Bergman, pp. 284–307. BAR International Series 329, Oxford.
- Noble, W. and I. Davidson 1996 *Human Evolution, Language, and Mind: A Psychological and Archaeological Inquiry*. Cambridge University Press, Cambridge.
- Noone, H.V.V. 1934 Burins, un nouvel essai de leur classification. *Congrès Préhistorique Française* 11:478–488.
- Noy, T. and E.S. Higgs 1972 *Raqefet Cave*. Unpublished Report.
- O'Connell, J.F., K. Hawkes and N. Blurton-Jones 1988 Hadza hunting, butchering, and bone transport and their archaeological implications. *Journal of Anthropological Research* 44:113–161.
- O'Connell, J.F., K. Hawkes and N. Blurton-Jones 1990 Reanalysis of large mammal body part transport among the Hadza. *Journal of Archaeological Science* 17:301–326.
- Odell, G.H. and F. Odell-Vereecken 1980 Verifying the reliability of lithic use wear assessments by "blind tests": the low power approach. *Journal of Field Archaeology* 7:87–120.
- Ohnuma, K. 1986 *A Technological Study of the Upper Palaeolithic Material from Levels XXV–XIV from Ksar Akil*. Unpublished Ph.D. Thesis, UCL, London.
- Ohnuma, K. 1988 *Ksar 'Akil, Lebanon. A Technological Study of the Earlier Upper Palaeolithic Levels of Ksar 'Akil, vol. III. Levels XXV–XIV*. BAR International Series 426, Oxford.
- Ohnuma, K. and C.A. Bergman 1990 A technological analysis of the Upper Palaeolithic levels (XXV–VI) of Ksar Akil, Lebanon. In *The Emergence of Modern Humans: An Archaeological Perspective*, edited by P. Mellars and C. Stringer, pp. 91–138. Edinburgh University Press, Edinburgh.
- Olsen, J.W. 1987 Recent developments in the Upper Pleistocene prehistory of China. In *The Pleistocene Old World: Regional*

- Perspectives*, edited by O. Soffer, pp. 135–146. Plenum, New York.
- Olszewski, D.I. 1993 The Late Baradostian Occupation at Warwasi Rockshelter, Iran. In *The Paleolithic Prehistory of the Zagros-Taurus*, edited by H.L. Dibble, pp. 187–205. University of Pennsylvania, Philadelphia.
- Olszewski, D.I. 1994 The Zagros Aurignacian. *Current Anthropology* 35:68–75.
- Olszewski, D.I. 1997 From the Late Ahmari to the Early Natufian: a summary of hunter-gatherer activities at Yutil al-Hasa, west-central Jordan. In *The Prehistory of Jordan II. Perspectives from 1997*, edited by H.-G. Gebel, Z. Kafafi and G.O. Rollefson, pp. 171–182. SENEPESE 4. ex oriente, Berlin.
- Olszewski, D.I. 1999 The early Upper Palaeolithic in the Zagros Mountains. In *Dorothy Garrod and the Progress of the Palaeolithic*, edited by W. Davies and R. Charles, pp. 167–180. Oxbow, Oxford.
- Olszewski, D.I. 2000 The Epipaleolithic in the Wadi al-Hasa: an overview. In *The Archaeology of the Wadi Al-Hasa, West-Central Jordan, vol. 2: Excavations at Middle, Upper and Epipalaeolithic Sites*, edited by N.R. Coinman, pp. 227–243. Arizona State University, Tempe.
- Olszewski, D.I., G.A. Clark and S.K. Fish 1990 WHS 784X (Yutil al-Hasa): a Late Ahmari site in the Wadi Hasa, west-central Jordan. *Proceedings of the Prehistoric Society* 56:33–49.
- Olszewski, D.I. and N.R. Coinman 1998 Settlement patterning during the late Pleistocene in the Wadi al-Hasa, west-central Jordan. In *The Archaeology of the Wadi al-Hasa, West-Central Jordan, vol. 1: Surveys, Settlement Patterns and Paleo-environments*, edited by N.R. Coinman, pp. 177–203. Arizona State University, Tempe.
- Olszewski, D.I., N.R. Coinman, T. Clausen, J.B. Cooper, H. Jansson, M. al-Nahar, L. Saele, A. Sampson, U. Schurmans and J. Thompson in press The eastern al-Hasa late Pleistocene project. Preliminary report on the 2000 season. *Annual of the Department of Antiquities of Jordan*.
- Olszewski, D.I., N.R. Coinman, J. Schuldenrein, T. Clausen, J.B. Cooper, J. Fox, J.B. Hill, M. al-Nahar and J. Williams 1998 The eastern al-Hasa late Pleistocene project. A preliminary report on the 1997 season. *Annual of the Department of Antiquities of Jordan* XLII:53–74.
- Olszewski, D.I., M. Stevens, M. Glass, R.F. Beck, J.B. Cooper and G.A. Clark 1994 The 1993 excavations at Yutil al-Hasa (WHS 784), an Upper/Epipaleolithic site in west-central Jordan. *Paléorient* 20:129–141.
- O'Neil, J.R., R.N. Clayton and T.K. Mayeda 1969 Oxygen isotope fractionation of divalent metal carbonates. *Journal of Chemical Physics* 30:5547–5558.
- Orschiedt, J. and G.-C. Weniger (editors) 2000 *Neanderthals and Modern Humans. Discussing the Transition: Central and Eastern Europe from 50,000–30,000 B.P.* Neanderthal Museum, Dusseldorf.
- Otte, M. and L.H. Keeley 1990 The impact of regionalisation on Palaeolithic studies. *Current Anthropology* 31:577–582.
- Otte, M., I. Yalçinkaya, J. Kozłowski, O. Bar-Yosef, H. Taşkiran and P. Noiret 1995a Evolution Technique au Paléolithique Ancien de Karain (Turquie). *L'Anthropologie* 99:529–561.
- Otte, M., I. Yalçinkaya, J.-M. Leotard, M. Kartal, O. Bar-Yosef, J. Kozłowski, I.L. Bayon and A. Marshack 1995b The Epipalaeolithic of Okuzini cave (SW Anatolia) and Its Mobiliary Art. *Antiquity* 69:931–944.
- Otte, M., I. Yalçinkaya, J.K. Kozłowski, O. Bar-Yosef, I.L. Bayon and H. Taşkiran 1998 Long-term technical evolution and human remains in the Anatolian Palaeolithic. *Journal of Human Evolution* 34:413–431.
- Özdoğan, M. 1998 Anatolia from the last glacial maximum to the Holocene climatic optimum: cultural formations and the impact of the environmental setting. *Paléorient* 23:25–38.
- Parry, W.J. and R.L. Kelly 1987 Expedient core technology and sedentism. In *The Organization of Core Technology*, edited by J.K. Johnson and C.A. Morrow, pp. 285–313. Westview Press, Boulder.
- Pelcin, A. 1996 *Controlled Experiments in the Production of Flake Attributes*. Unpublished Ph.D. Thesis, University of Pennsylvania, Philadelphia.
- Pelegrin, J. 1990a Prehistoric lithic technology: some aspects of research. *Archaeological Review from Cambridge* 9:116–125.
- Pelegrin, J. 1990b Observations technologiques sur quelques séries du Châtelperronien et du MTA B du sud-ouest de la France. Une hypothèse d'évolution. In *Paléolithique Moyen Récent et Paléolithique Supérieur Ancien en Europe*, edited by C. Farizy, pp. 39–42. APRAIF, Nemours.
- Pelegrin, J. 1993 Framework for analysing prehistoric stone tool manufacture and a tentative application to some early stone industries. In *Use of Tools by Human and Non-Human Primates*, edited by A. Berthelet and J. Chavaillon, pp. 302–314. Clarendon Press, Oxford.
- Pelegrin, J. 1997 Les techniques de débitage laminaire au Tardiglaciaire: critères de diagnose et quelques réflexions. In *Actes de la Table Ronde*, pp. 265–280. APRAIF, Nemours.
- Pelegrin, J., C. Karlin and P. Bodu 1988 “Chaînes opératoires”: un outil pour le préhistorien. In *Technologie Préhistorique*, pp. 55–62. CNRS, Paris.
- Perlès, C. 1993 Ecological determinism, group strategies, and individual decisions in the conception of prehistoric stone assemblages. In *The Use of Tools by Human and Non-Human Primates*, edited by A. Berthelet and J. Chavaillon, pp. 267–277. Clarendon Press, Oxford.
- Perrot, J. 1955 Le Paléolithique supérieur d'el-Quseir et de Masaraq an Na'aj (Palestine). *Bulletin de la Société Pré-historique Française* 52:493–506.
- Perrot, J. 1968 La préhistoire Palestinienne. In *Supplément au Dictionnaire de la Bible*, vol. 8, pp. 286–446. Letougey et Ane, Paris.
- Peterkin, G.L. 1993 Lithic and organic hunting technology in the French Upper Palaeolithic. Hunting and animal exploitation in the later Palaeolithic and Mesolithic of Eurasia. In *Hunting and Animal Exploitation in the Later Palaeolithic and Mesolithic of Eurasia*, edited by G.L. Peterkin, H.M. Bricker and P. Mellars, pp. 49–67. AP3A, Washington DC.
- Peterkin, G.L., H.M. Bricker and P. Mellars (editors) 1993 *Hunting and Animal Exploitation in the Later Palaeolithic and Mesolithic of Eurasia*. AP3A, Washington DC.
- Peyrony, D. 1930 Le Moustier, ses gisements, ses industries, ses couches géologiques. *Revue Anthropologique* 40:48–76; and 155–176.
- Phillips, J.L. 1987a Sinai during the Paleolithic: the early periods. In *Prehistory of Arid North Africa: Essays in Honor of Fred Wendorf*, edited by A.E. Close, pp. 105–121. SMU Press, Dallas.
- Phillips, J.L. 1987b Upper Paleolithic hunter-gatherers in the Wadi Feiran, southern Sinai. In *The Pleistocene Old World*, edited by O. Soffer, pp. 169–182. Plenum Press, New York.
- Phillips, J.L. 1988 The Upper Paleolithic of the Wadi Feiran, southern Sinai. *Paléorient* 14:183–199.
- Phillips, J.L. 1991 Refitting, edge wear and chaînes opératoires: a case study from Sinai. In *25 Ans d'Études Technologiques en Préhistoire*, edited by L. Meignen, pp. 305–317. APDCA, Juanles-Pins.
- Phillips, J.L. 1994 The Upper Paleolithic chronology of the Levant and the Nile Valley. In *Late Quaternary Chronology and Paleoclimates of the Eastern Mediterranean*, edited by O. Bar-Yosef and R.S. Kra, pp. 169–176. Radiocarbon, Tucson.

- Phillips, J.L. in press The use of the *chaînes opératoires* approach in the Upper Paleolithic period of Sinai. In *Written in Stone: Multiple Dimensions of Lithic Analysis*, edited by P.N. Kardulias and R. Yerkes.
- Phillips, J.L. and B.G. Gladfelter 1989 A survey in the upper Wadi Feiran, southern Sinai. *Paléorient* 15:113–122.
- Phillips, J.L. and I.N. Saca in press The Dorothy Garrod collection from the sites of el-Wad, Kebara, and Atlit at the Field Museum of Natural History. *Fieldiana*.
- Piazza, A. 1998 Towards a genetic history of China. *Nature* 395:636–639.
- Pichon, J. 1991 Les oiseaux au Natoufien, avifauna et sédentarité. In *The Natufian Culture in the Levant*, edited by O. Bar-Yosef and F.R. Valla, pp. 371–380. International Monographs in Prehistory, Ann Arbor.
- Pigeot, N. 1990 Technical and social actors: flint knapping specialist at Magdalenian Étiolles. *Archaeological Review from Cambridge* 9:126–141.
- Pigeot, N. 1991 Réflexions sur l'histoire technique de l'homme: de l'évolution cognitive à l'évolution culturelle. *Paléo* 3:167–200.
- Pinch, T. and W. Bijker 1987 The social construction of facts and artifacts: or how the sociology of science and the sociology of technology might benefit each other. In *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, edited by W. Bijker, T. Hughes and T. Pinch, pp. 17–50. MIT Press, Cambridge.
- Ploux, S. 1991 Technologie, technicité, techniciens: méthode de détermination d'auteurs et comportements techniques individuels. In *25 Ans d'Études Technologiques en Préhistoire*, edited by L. Meignen, pp. 201–214. Éditions APDCA, Juanles-Pins.
- Ploux, S. 1999 Le Paléolithique supérieur d'Umm el-Tlel (basin d'el Kowm, Syrie): observations préliminaires. *Cahiers de l'Euphrate* 8:37–54.
- Potter, J.M. 1993 *Middle Paleolithic Assemblage and Settlement Variability in West-Central Jordan*. Arizona State University, Tucson.
- Price, T.D. 1991 Postscript: the end of spatial analysis. In *The Interpretation of Archaeological Spatial Patterning*, edited by E.M. Kroll and T.D. Price, pp. 301–305. Plenum Press, New York.
- Rabinovich, R. 1998a *Patterns of Animal Exploitation and Subsistence in Israel During the Upper Palaeolithic and Epi-Palaeolithic (40,000–12,500 BP), Based Upon Selected Case Studies*. Unpublished Ph.D. Thesis, Hebrew University, Jerusalem.
- Rabinovich, R. 1998b "Drowning in numbers" – gazelles dominance and body size in the archaeozoological record. In *Archaeozoology of the Near East III*, edited by H. Buitenhuis, L. Bartosiewicz and A.M. Choyke, pp. 45–71. ARC Publications, Groningen.
- Radick, G. 1999 Language, brain function and human origins in the Victorian debates on evolution. *Studies in the History and Philosophy of the Biological and Biomedical Sciences* 31:55–75.
- Reese, D.S. 1982 Marine and fresh-water molluscs from the Epipaleolithic site of Hayonim Terrace, western Galilee, northern Israel, and other east Mediterranean sites. *Paléorient* 8:83–90.
- Reese, D.S. 1991 Marine shells in the Levant: Upper Palaeolithic, Epipaleolithic and Neolithic. In *The Natufian Culture in the Levant*, edited by O. Bar-Yosef and F.R. Valla, pp. 613–628. International Monographs in Prehistory, Ann Arbor.
- Reese, D.S. 1995 Shells from the Wadi Hisma sites. In *Prehistoric Cultural Ecology and Evolution. Insights from Southern Jordan*, edited by D.O. Henry, pp. 385–390. Plenum Press, New York.
- Renfrew, C. 1978 The anatomy of innovation. In *Social Organization and Settlement: Contributions from Anthropology, Archaeology and Geography*, edited by D. Green, C. Haselgrove and M. Spriggs, pp. 89–117. BAR International Series 47, Oxford.
- Révillion, S. and A. Tuffreau (editors) 1994 *Les Industries Laminaires au Paléolithique Moyen*. CNRS, Paris.
- Rigaud, J.-P. 1993 L'Aurignacien dans le sud-ouest de la France: bilan et perspectives. In *Actes du XIIème Congrès UISPP*, edited by J. Pavuk, pp. 181–186. vol. 2. Institut Archéologique de l'Académie Slovaque des Sciences, Bratislava.
- Rigaud, J.-P. and J.-M. Géneste 1988 L'utilisation de l'espace dans la Grotte Vaufréy. In *La Grotte Vaufréy: Paléoenvironnement-Chronologie-Activités*, edited by J.-P. Rigaud, pp. 593–611. Mémoires de la Société Préhistorique Française XIX, Paris.
- Rink, W.J., H.P. Schwarcz, H.K. Lee, V. Cabrera Valdes, F. Bernaldo de Quiros and H. Hoyos 1996 ESR dating of tooth enamel: comparison with AMS 14C at el Castillo Cave, Spain. *Journal of Archaeological Science* 23:945–951.
- Roebroeks, W., J. Kolen and E. Rensink 1988 Planning depth, anticipation and the organization of Middle Palaeolithic technology: the "archaic natives" meet Eve's descendants. *Helinium* 28:17–34.
- Rolett, B.V., W.-C. Chen and J.M. Sinton 1998 Taiwan, Neolithic seafaring and Austronesian origins. *Antiquity* 74:54–61.
- Rolland, N. 1996 Biogéographie et préhistoire: le cas de peuplement Paléolithique inférieur de l'Europe. In *Nature et Culture*, edited by M. Otte, pp. 11–61. ERAUL, Liège.
- Rolland, N. 1998 The Lower Palaeolithic settlement of Eurasia, with special reference to Europe. In *Early Human Behaviour in Global Context*, edited by M.D. Petraglia and R. Korisettar, pp. 187–220. Routledge, London.
- Ronen, A. 1976 The Upper Palaeolithic in northern Israel, Mt. Carmel and Galilee. In *Deuxième Colloque sur la Terminologie de la Préhistoire du Proche-Orient*, edited by F. Wendorf, pp. 153–186. 9th Congress, UISPP, Nice.
- Ronen, A. (editor) 1984 *The Sefunim Prehistoric Sites, Mount Carmel, Israel*. BAR International Series 230, Oxford.
- Ronen, A. and D. Kaufman 1976 Epi-palaeolithic sites near Nahal Hadera, central coastal plain of Israel. *Tel Aviv* 3:16–30.
- Ronen, A. and B. Vandermeersch 1972 The Upper Paleolithic sequence in the cave of Qafza (Israel). *Quaternaria* 16:189–202.
- Rosignol-Strick, M. 1995 Sea-land correlation of pollen records in the eastern Mediterranean for the glacial-interglacial transition: biostratigraphy versus radiometric time-scale. *Quaternary Science Review* 14:893–915.
- Rozoy, J.G. 1968 L'étude du matériel brut et des microburins dans l'Épipaléolithique (Mésolithique) franco-belge. *Bulletin de la Société Préhistorique Française* 65:365–390.
- Rust, A. 1950 *Die Höhlenfunde von Jabrud (Syrien)*. Karl Wachholtz, Neumunster.
- Sackett, J.R. 1990 Style and ethnicity in archaeology: the case for isochrestism. In *The Uses of Style in Archaeology*, edited by M.W. Conkey and C.A. Hastorf, pp. 32–43. Cambridge University Press, Cambridge.
- Sala, I. 1982 *Carinated Tools or Cores: A Microwear Study of Material from Ksar Akil*. Unpublished BA Thesis, UCL, London.
- Sanlaville, P. 2000 *Le Moyen-Orient Arabe: Le Milieu et l'Homme*. Armand Colin, Paris.
- Saxon, E.C. 1974 The mobile herding economy of Kebara cave, Mt. Carmel: an economic analysis of the faunal remains. *Journal of Archaeological Science* 1:27–45.
- Saxon, E.C., G. Martin and O. Bar-Yosef 1978 Nahal Hadera V: an open-air site on the Israeli littoral. *Paléorient* 4:253–265.

- Schick, T. and M. Stekelis 1977 Mousterian assemblages in Kebara cave, Mount Carmel. *Eretz Israel* 13:97–149.
- Schiegl, S., P. Goldberg, O. Bar-Yosef and S. Weiner 1996 Ash deposits in Hayonim and Kebara caves, Israel: macroscopic, microscopic and mineralogical observations, and their archaeological implications. *Journal of Archaeological Science* 23:763–781.
- Schlanger, N. 1995a Mindful technology: unleashing the *chaîne opératoire* for an archaeology of the mind. In *The Ancient Mind. Elements of Cognitive Archaeology*, edited by C. Renfrew and E.B.W. Zubrow, pp. 143–151. Cambridge University Press, Cambridge.
- Schlanger, N. 1995b Understanding Levallois: lithic technology and cognitive archaeology. *Cambridge Archaeological Journal* 6:231–254.
- Schlanger, N. 1998 The study of techniques as an ideological challenge: technology, nation, and humanity in the work of Marcel Mauss. In *Marcel Mauss: A Century Tribute*, edited by W. James and N. Allen, pp. 192–212. Bergahn Press, Oxford.
- Schmider, B. and M. Perpère 1995 Production et utilisation de lamelles dans l'Aurignacien de la Grotte du Renne à Arcy-sur-Cure. In *Paléolithique Supérieur et Epipaléolithique dans le Nord-Est de la France*, edited by Y. Pautrat and A. Thévenin, pp. 4–10. Dijon.
- Schramm, A., M. Stein and S.L. Goldstein 2000 Calibration of the 14C timescale to >40 ka by 234U–230Th dating of Lake Lisan sediments (last glacial Dead Sea). *Earth and Planetary Science Letters* 175:27–40.
- Schroeder, B. 1969 *The Lithic Industries from Jerf Ajla and Their Bearing on the Problem of a Middle to Upper Paleolithic Transition*. Unpublished Ph.D. Thesis, Columbia University, New York.
- Schroeder, B. 1991 Natufian in the central Beqaa Valley, Lebanon. In *The Natufian Culture in the Levant*, edited by O. Bar-Yosef and F.R. Valla, pp. 43–80. International Monographs in Prehistory, Ann Arbor.
- Schuldenrein, J. 1998 Geomorphology and Stratigraphy of Prehistoric Sites along the Wadi al-Hasa. In *The Archaeology of the Wadi al-Hasa, West-Central Jordan, vol. 1. Surveys, Settlement Patterns and Paleoenvironments*, edited by N.R. Coinman, pp. 205–228. Arizona State University, Tempe.
- Schuldenrein, J. and G.A. Clark 1994 Landscape and prehistoric chronology of west-central Jordan. *Geoarchaeology* 9:31–55.
- Schwarcz, H.P. 1986 Geochronology and isotopic geochemistry of speleothems. In *Handbook of Environmental Isotope Geochemistry, vol. 2, The Terrestrial Environment B*, edited by P. Fritz and G. Fontes, pp. 271–303. Elsevier, Amsterdam.
- Schwarcz, H.P., B. Blackwell, P. Goldberg and A.E. Marks 1979 Uranium series dating of travertine from archaeological sites, Nahal Zin, Israel. *Nature* 277:558–560.
- Schwarcz, H.P. and W.J. Rink 1998 Progress in ESR and U-Series chronology of the Levantine Paleolithic. In *Neandertals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 57–67. Plenum Press, New York.
- Schwarcz, H.P. and C. Yonge 1983 Isotopic composition of paleowaters as inferred from speleothem and its fluid inclusions. In *Paleoclimates and Paleowaters: A Collection of Environmental Isotope Studies*, edited by R. Gonfiantini, pp. 115–133. International Atomic Energy Agency, Vienna.
- Schyle, D. 1992 Near Eastern Upper Paleolithic cultural stratigraphy. In *Biehefte zum Tübinger Atlas des Vorderen Orients, Reihe B (Geisteswissenschaften) Nr. 59*. Dr. Ludwig Reichert, Wiesbaden.
- Schyle, D. and H.-G. Gebel 1997 Upper Palaeolithic Siq Umm al-Alda 1, near Wadi Musa, southern Jordan. In *The Prehistory of Jordan, II. Perspectives from 1997*, edited by H.-G. Gebel, Z. Kafafi and G.O. Rollefson, pp. 149–170. SENEPSSE 4. ex oriente, Berlin.
- Schyle, D. and H.-P. Uerpman 1988 Palaeolithic sites in the Petra area. In *The Prehistory of Jordan. The State of Research in 1986*, edited by A.N. Garrard and H.-G. Gebel, pp. 39–65. BAR International Series 396, Oxford.
- Sellet, F. 1993 *Chaîne Opératoire*; the concept and its applications. *Lithic Technology* 18:106–112.
- Sellet, F. 1995 Levallois or not Levallois: does it really matter? Learning from an African case. In *The Definition and Interpretation of Levallois Technology*, edited by H.L. Dibble and O. Bar-Yosef, pp. 25–40. Prehistory Press, Madison.
- Semino, O., J. Passarino, P. Francalacci, A. Kouvatsi, S. Umborska, M. Marcikiae, A. Mika, B. Mika, D. Primorac, A.S. Santachiara-Benerecetti, L.L. Cavalli-Sforza and P.A. Underhill 2000 The genetic legacy of Paleolithic *Homo sapiens* in extant Europeans: A Y chromosome perspective. *Science* 210:1155–1159.
- Shackleton, N.J. 1969 The last interglacial in the marine and terrestrial records. *Proceedings of the Royal Society of London B* 174:135–154.
- Shackleton, N.J. 1987 Oxygen isotopes, ice volume and sea level. *Quaternary Science Review* 6:183–190.
- Shea, J.J. 1988 Spear points from the Middle Paleolithic of the Levant. *Journal of Field Archaeology* 15:441–450.
- Shea, J.J. 1989 A functional study of lithic industries associated with hominid fossils in the Kebara and Qafzeh Caves, Israel. In *The Human Revolution: Behavioural and Biological Perspectives in the Origins of Modern Humans*, edited by P. Mellars and C.B. Stringer, pp. 611–625. Edinburgh University Press, Edinburgh.
- Shea, J., Z. Davis and K. Brown 2001 Experimental tests of Middle Paleolithic spear points using a calibrated crossbow. *Journal of Archaeological Science* 28:807–816.
- Sherratt, A. 1996 Plate tectonics and imaginary prehistories: structure and contingency in agricultural origins. In *The Origins and Spread of Agriculture and Pastoralism in Eurasia*, edited by D.R. Harris, pp. 130–141. Smithsonian Institution Press, Washington, DC.
- Shott, M. 1986 Technological organization and settlement mobility: an ethnographic examination. *Journal of Anthropological Research* 42:15–51.
- Shreeve, J. 1995 *The Neandertal Enigma. Solving the mystery of modern human origins*. William Morrow and Company, New York.
- Simchoni, O. 1997 *Reconstruction of the Landscape and Human Economy 19,000 BP in the Upper Jordan Valley by the Botanical Remains Found at Ohalo II*. Unpublished Ph.D. Thesis, Bar-Ilan University, Ramat Gan (Hebrew).
- Simmons, T. and D. Nadel 1998 The avifauna of the early Epipalaeolithic site of Ohalo II (19,400 years BP), Israel: species diversity, habitat and seasonality. *International Journal of Osteoarchaeology* 8:79–96.
- Skrdla, P. 1996 The Bohunician reduction strategy. *Quaternaria Nova* VI:93–108.
- Sokal, R.R. and F.J. Rohlf 1995 *Biometry*. W.H. Freeman, New York.
- Solecki, R. and R. Solecki 1970 A new secondary flaking technique at the Nahr Ibrahim Cave site, Lebanon. *Beyrouth* 23:137–142.
- Sonneville-Bordes, D. de 1953 Essai d'adaptation des méthodes statistiques au Paléolithique supérieur: premiers résultats. *Bulletin de la Société Préhistorique Française* 50:323–333.
- Sonneville-Bordes, D. de 1963 Aurignacien et Périgordien entre Loire et Garonne. *Bulletin de la Société Méridionale de Spéléologie et de Préhistoire – Special Issue: Aurignac et l'Aurignacien, Centenaire des Fouilles*:51–62.
- Sonneville-Bordes, D. de and J. Perrot 1954–1956 Lexique

- typologique du Paléolithique supérieur. Outillage lithique. *Bulletin de la Société Préhistorique Française* 51–52–53:327–335; 76–79; 408–412; 547–559.
- Soriano, S. 1998 Les microgravettes du Périgordien de Rabier à Lanquais (Dordogne). *Gallia Préhistoire* 40:75–94.
- Speth, J.D. 1972 Mechanical basis for percussion flaking. *American Antiquity* 37:34–60.
- Speth, J.D. 1974 Experimental investigations of hard-hammer percussion flaking. *Tebawi* 17:7–36.
- Speth, J.D. 1975 Miscellaneous studies in hard-hammer percussion flaking: the effects of oblique impact. *American Antiquity* 40:203–207.
- Speth, J.D. 1981 The role of platform angle and core size in hard hammer percussion flaking. *Lithic Technology* 10:16–21.
- Speth, J.D. and E. Tchernov 1998 The role of hunting and scavenging in Neandertal procurement strategies. In *Neandertals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 223–239. Plenum Press, New York.
- Stahle, D.W. and J.E. Dunn 1982 An analysis and application of the size distribution of waste flakes from the manufacture of bifacial stone tools. *World Archaeology* 14:84–97.
- Stark, M.T. 1995 Economic intensification and ceramic specialization in the Philippines: a view from Kalinga. *Research in Economic Anthropology* 16:179–226.
- Stekelis, M. 1954 Nouvelles fouilles dans le Grotte de Kebarah. Paper presented at the *Congressos Internacionales de Ciencias Prehistoricas y Prohistoricas*, Madrid, Zaragoza.
- Stekelis, M. 1961 'Iraq el-Baroud – nouvelle grotte préhistorique au Mont Carmel. *The Bulletin of the Research Council of Israel* 10G:302–320.
- Steward, J.H. 1929 Diffusion and independent invention: a critique of logic. *American Anthropologist* 31:491–495.
- Stiegler, B. 1998 *Technics and Time 1: The Fault of Epimetheus*. Stanford University Press, Stanford.
- Stiner, M.C. 1999a Paleolithic mollusc exploitation at Riparo Mochi (Balzi Rossi, Italy): food and ornaments from the Aurignacian through Epigravettian. *Antiquity* 73:735–754.
- Stiner, M.C. 1999b Thirty years on: the “Broad Spectrum Revolution” and Paleolithic demography. *Proceedings of the National Academy of Sciences* 98:6993–6996.
- Stiner, M.C., N.D. Munro and T.A. Surovell 2000 The tortoise and the hare: small game use, the Broad Spectrum Revolution, and Paleolithic demography. *Current Anthropology* 41:39–73.
- Stiner, M.C., N.D. Munro, T.A. Surovell, E. Tchernov and O. Bar-Yosef 1999 Paleolithic population growth pulses evidenced by small animal exploitation. *Science* 283:190–194.
- Stordeur-Yedid, D. 1979 *Les Aiguilles à Chasse au Paléolithique*. CNRS, Paris.
- Straus, L.G. 1989 Age of the modern Europeans. *Nature* 342:476–477.
- Straus, L.G. 1994 Upper Paleolithic origins and radiocarbon calibration: more new evidence From Spain. *Evolutionary Anthropology* 2:189–226.
- Streuver, S. 1971 Comments on archaeological data requirements and research strategy. *American Antiquity* 36:9–19.
- Stringer, C.B. 1999 Has Australia backdated the Human Revolution? *Antiquity* 73:876–879.
- Stringer, C.B. and P. Andrews 1998 Genetic and fossil evidence for the origin of modern humans. *Science* 239:1263–1268.
- Stringer, C.B. and C. Gamble 1993 *In Search of the Neanderthals: Solving the Puzzle of Modern Human Origins*. Thames and Hudson, New York.
- Sullivan III, A.P. and K.C. Rosen 1985 Debitage analysis and archaeological interpretation. *American Antiquity* 50:755–779.
- Svoboda, J. and P. Skrdla 1995 Bohunician technology. In *The Definition and Interpretation of Levallois Technology*, edited by H.L. Dibble and O. Bar-Yosef, pp. 432–438. Prehistory Press, Madison.
- Swisher, C.C., W.J. Rink, S.C. Antón, H.P. Schwarcz, G.H. Curtis, A. Suprijo and Widiasmoro 1996 Latest *Homo erectus* of Java: potential contemporaneity with *Homo sapiens* in southeast Asia. *Science* 13:1870–1874.
- Tarawneh, B. 1996 *al 'Ina Geological Map 3151, Scale 1:50,000*. Geology Directorate, National Resources Authority, Ministry of Energy and Mineral Resources, Hashemite Kingdom of Jordan.
- Tchernov, E. 1962 Paleolithic avifauna in Palestine. *The Bulletin of the Research Council of Israel* 11:95–131.
- Tchernov, E. 1968 *Succession of Rodent Faunas During the Upper Pleistocene of Israel*. Mammalia Depicta, Paul Parey, Hamburg and Berlin.
- Tchernov, E. 1976 Some late Quaternary faunal remains from the Avdat/Aqev area. In *Prehistory and Paleoenvironments in the Central Negev, Israel, vol. 1. The Avdat/Aqev Area, Part 1*, edited by A.E. Marks, pp. 69–73. SMU Press, Dallas.
- Tchernov, E. 1981 The biostratigraphy of the Middle East. In *Prehistoire du Levant*, edited by P. Sanlaville and J. Cauvin, pp. 67–97. CNRS, Paris.
- Tchernov, E. 1984a Commensal animals and human sedentism in the Middle East. In *Animals and Archaeology: 3. Early Herders and Their Flocks*, edited by J. Clutton-Brock and C. Grigson, pp. 91–115. BAR International Series 202, Oxford.
- Tchernov, E. 1984b The fauna of Sefunim Cave, Mt. Carmel. In *Sefunim Prehistoric Sites, Mount Carmel, Israel*, edited by A. Ronen, pp. 401–419. BAR International Series 230, Oxford.
- Tchernov, E. 1988 The biogeographical history of the southern Levant. In *The Zoogeography of Israel*, edited by Y. Yom-Tov and E. Tchernov, pp. 159–250. Dr. Junk Publishers, Dordrecht.
- Tchernov, E. 1991a The Middle Paleolithic mammalian sequence and its bearing on the origin of *Homo Sapiens* in the southern Levant. In *Le Squelette Mousterien de Kébara 2*, edited by O. Bar-Yosef and B. Vandermeersch, pp. 77–88. CNRS, Paris.
- Tchernov, E. 1991b Of mice and men, biological markers for long-term sedentism: a reply. *Paléorient* 17:153–160.
- Tchernov, E. 1993 From sedentism to domestication – a preliminary review for the southern Levant. In *Skeletons in Her Cupboard*, edited by A. Clason, S. Payne and H.-P. Uerpmann, pp. 189–233. Oxbow, Oxford.
- Tchernov, E. 1998 An attempt to synchronize the faunal changes with the radiometric dates and the cultural chronology in southwest Asia. In *Archaeozoology of the Near East III*, edited by H. Buitenhuis, L. Bartosiewicz and A.M. Choyke, pp. 7–44. ARC Publications, Groningen.
- Tchernov, E., T. Dayan and Y. Yom-Tov 1986 The paleogeography of *Gazella gazella* and *Gazella dorcas* during the Holocene of the southern Levant. *Israel Journal of Zoology* 34:51–59.
- Thieme, H. 1997 Lower Palaeolithic hunting spears from Germany. *Nature* 385:807–810.
- Thomas, D.H. 1986 *Refiguring Anthropology: First Principles of Probability and Statistics*. Waveland Press, Prospect Heights, Illinois.
- Thompson, P., H.P. Schwarcz and D.C. Ford 1974 Continental Pleistocene climatic variations from speleothem age and isotopic data. *Science* 184:893–895.
- Thorne, A.G., R. Grun, G. Mortimer, N. Spooner, J. Simpson, M. McCulloch, L. Taylor and D. Curnoe 1999 Australia's oldest human remains: age of the Lake Mungo 3 skeleton. *Journal of Human Evolution* 36:591–612.
- Tixier, J. 1963 *Typologie de l'Épipaléolithique du Maghreb*. CRAPE, Paris.
- Tixier, J. 1970 L'Abri sous roche de Ksar Aqil: la campagne de fouilles 1969. *Bulletin de la Musée de Beyrouth* 33:173–191.

- Tixier, J. 1974 Fouille à Ksar Akil, Liban (1969–1974). *Paléorient* 2:183–185.
- Tixier, J. 1984 Lames. In *Préhistoire de la Pierre Taillée*, vol. 2: *Économie du Débitage Laminaire: Technologie et Expérimentation*, pp. 13–21. CREP, Paris.
- Tixier, J. and M.-L. Inizan 1981 Ksar Aqil: stratigraphie et ensembles lithiques dans le Paléolithique supérieur: fouilles 1971–1975. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, pp. 353–367. CNRS, Paris.
- Tixier, J., M.-L. Inizan and H. Roche 1980 *Préhistoire de la Pierre Taillée*. vol. 1: *Terminologie et Technologie*. CREP, Antibes.
- Tostevin, G.B. 2000a *Behavioral Change and Regional Variation across the Middle to Upper Paleolithic Transition in Central Europe, Eastern Europe and the Levant*. Unpublished Ph.D. Thesis, Harvard University, Cambridge.
- Tostevin, G.B. 2000b The Middle to Upper Paleolithic transition from the Levant to central Europe: *in situ* development or diffusion? In *Neanderthals and Modern Humans. Discussing the Transition: Central and Eastern Europe from 50,000–30,000 BP*, edited by J. Orschiedt and G.-C. Weniger, pp. 92–111. Neanderthal Museum, Dusseldorf.
- Tsatskin, A., M. Weinstein-Evron and A. Ronen 1995 Weathering and pedogenesis of wind-blown sediments in the Mt. Carmel caves, Israel. In *Windblown Sediments in the Quaternary*, edited by E. Derbyshire, pp. 83–93. Wiley, Chichester.
- Turville-Petre, F. 1932 The excavations in the Mugharet et-Kebarah. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 62:271–276.
- Tylor, E.B. 1896 On American lot-games, as evidence of Asiatic intercourse before the time of Columbus. *Internationales Archiv für Ethnographie* 19:55–67.
- Underhill, P.A., G. Passarino, A.A. Lin, P. Shen, M. Mirazon Lahr, R.A. Foley, P.J. Oefner and L.L. Cavalli-Sforza 2001 The phylogeography of Y chromosome binary haplotypes and the origins of modern human populations. *Annual of Human Genetics* 65:43–62.
- Valla, F.R. 1984 *Les Industries de Silex de Mallaha (Eynan) et du Natoufien dans le Levant*. Association Paléorient, Paris.
- Valladas, H., J. Clottes, J.-M. Géneste, M.A. Garcia, M. Arnold, H. Cachier and N. Tisnerat-Laborde 2001 Evolution of prehistoric cave art. *Nature* 413:479.
- Valladas, H., J.-L. Joron, G. Valladas, B. Arensburg, O. Bar-Yosef, A. Belfer-Cohen, P. Goldberg, H. Laville, L. Meignen, Y. Rak, E. Tchernov, A.-M. Tillier and B. Vandermeersch 1987 Thermoluminescence dates for the Neanderthal burial site at Kebara in Israel. *Nature* 330:159–160.
- Valladas, H., N. Mercier, J.-L. Joron and J.-L. Reyss 1998 GIF laboratory dates for Middle Paleolithic Levant. In *Neanderthals and Modern Humans in Western Asia*, edited by T. Akazawa, K. Aoki and O. Bar-Yosef, pp. 69–76. Plenum Press, New York.
- Valoch, K. 1990 La Moravie il y a 40,000 ans. In *Paléolithique Moyen récent et Paléolithique Supérieur ancien en Europe*, edited by C. Farizy, pp. 115–124. APRAIF, Nemours.
- Van Peer, P. 1992 *The Levallois Reduction Strategy*. Prehistory Press, Madison.
- Van Peer, P. 1995 Current issues in the Levallois problem. In *The Definition and Interpretation of Levallois Technology*, edited by H.L. Dibble and O. Bar-Yosef, pp. 1–10. Prehistory Press, Madison.
- Van Peer, P. 1998 The Nile corridor and the out-of-Africa model. *Current Anthropology* 39:115–140.
- Van Regteren Altena, C.O. 1962 Molluscs and echinoderms from Paleolithic deposits in the rock shelter of Ksar 'Akil, Lebanon. *Zoologische Mededelingen* 38:87–97.
- Vaufrey, R. 1951 Étude paléontologique, I: mammifères. In *Le Paléolithique et le Mésolithique du Désert de Judée*, edited by R. Neuville, pp. 198–217. Institut de Paléontologie Humaine, Paris.
- Vaughan, P. 1985 *Use-Wear Analysis of Flaked Stone Tools*. Unpublished Ph.D. Thesis, University of Arizona, Tucson.
- Vermeersch, P. (editor) 2000 *Paleolithic Living sites in Upper and Middle Egypt*. Leuven University Press, Leuven.
- Vermeersch, P., E. Paulissen, S. Stokes, C. Charlier, P. Van Peer, C.B. Stringer and W. Lindsay 1998 A Middle Paleolithic burial of a modern human at Taramsa Hill, Egypt. *Antiquity* 72:475–484.
- Vermeersch, P.M., E. Paulissen, G. Gijssels, M. Otte, A. Thoma, P. Van Peer and R. Lauwers 1984 33,000-yr old chert mining site and related *Homo* in the Egyptian Nile valley. *Nature* 309:342–344.
- Vermeersch, P.M., E. Paulissen and P. Van Peer 1990 Palaeolithic chert exploitation in the limestone stretch of the Egyptian Nile valley. *The African Archaeological Review* 8:77–102.
- Vignard, E. 1921 Une station Aurignacienne à Nag Hammadi (haute Egypte), station du Champ de Bagasse. *Bulletin de l'Institut Française d'Archéologie Orientale* 18:1–20.
- Vignard, E. 1957 Points de vue nouveaux sur l'industrie du champ de Begasse près de Nag Hammadi (Haute Egypte). *Bulletin de la Société Préhistorique Française* 54:298–313.
- Villa, P. 2001 Early Italy and the colonization of western Europe. *Quaternary International* 75:113–130.
- Vishnyatsky, L. 1994 'Running ahead of time' in the development of Palaeolithic industries. *Antiquity* 68:134–140.
- Volkman, P.W. 1983 Boker Tachtit. Core reconstructions. In *Prehistory and Palaeoenvironments in the Central Negev, Israel, vol. III. The Avdat/Aqev Area, Part 3*, edited by A.E. Marks, pp. 127–188. Dept. of Anthropology, Southern Methodist University.
- Volkman, P.W. 1989 *Boker Tachtit: The Technological Shift from the Middle to the Upper Paleolithic in the Central Negev, Israel*. University Microfilm International, Ann Arbor.
- Volkman, P.W. and D. Kaufman 1983 A reassessment of the Emireh point as a possible type-fossil for the technological shift from the Middle to the Upper Paleolithic in the Levant. In *The Mousterian Legacy*, edited by E. Trinkaus, pp. 35–52. BAR International Series 164, Oxford.
- Wadley, L. 2001 What is cultural modernity? A central view and a South African perspective from Rose Cottage Cave. *Cambridge Archaeological Journal* 11:201–221.
- Wagner, R. 1981 *The Invention of Culture*. University of Chicago Press, Chicago.
- Weiner, S., P. Goldberg and O. Bar-Yosef 1993 Bone preservation in Kebara cave, Israel, using on-site fourier transform infrared spectrometry. *Journal of Archaeological Science* 20:613–627.
- Weiner, S., S. Schiegl, P. Goldberg and O. Bar-Yosef 1995 Mineral assemblages in Kebara and Hayonim caves, Israel: excavation strategies, bone preservation, and wood ash remnants. *Israel Journal of Chemistry* 35:143–154.
- Weinstein-Evron, M. 1983 The paleoecology of the early Wurm in the Hula basin, Israel. *Paléorient* 9:5–19.
- Weinstein-Evron, M. 1990 Palynological history of the last Pleniglacial in the Levant. In *Feuilles de Pierre: Les Industries à Pointes Foliacées du Paléolithique Supérieur Européen*, edited by J.K. Kozłowski, pp. 9–25. ERAUL, Liège.
- Weinstein-Evron, M. 1993 Paleoeological reconstruction of the Upper Paleolithic in the Levant. In *Actes du XIIème Congrès de UISPP*, edited by J. Pavuk, pp. 259–270. Vol. 2. Institut Archéologique de l'Académie Slovaque des Sciences, Bratislava.
- Weinstein-Evron, M. 1994 Biases in archaeology pollen assemblages: case studies from Israel. *Aspects of Archaeological Palynology: Methodology and Applications* 29:193–205.
- Whallon, R. 1973 Spatial analysis of occupation floors. I.

- Application of dimensional analysis of variance. *American Antiquity* 38:266–278.
- Whallon, R. 1984 Unconstrained clustering for the analysis of spatial distributions in archaeology. In *Intrasite Spatial Analysis in Archaeology*, edited by H.J. Hietala, pp. 242–277. Cambridge University Press, Cambridge.
- White, R. 1982 Rethinking the Middle/Upper Paleolithic transition. *Current Anthropology* 23:169–192.
- White, R. 1997 Substantial acts: from materials to meaning in Upper Paleolithic representation. In *Beyond Art: Pleistocene Image and Symbol*, edited by M.W. Conkey, O. Soffer, D. Stratmann and N. Jablonski, pp. 93–122. Memoirs of the California Academy of Science, San Francisco.
- Whittaker, R.H. 1972 Evolution and measurement of species diversity. *Taxon* 21:213–251.
- Wiessner, P. 1983 Style and social information in Kalahari San projectile points. *American Antiquity* 48:253–276.
- Wiessner, P. 1990 Is there a unity to style? In *The Uses of Style*, edited by M.W. Conkey and C.A. Hastorf, pp. 105–112. Cambridge University Press, Cambridge.
- Willey, G.R., C. DiPeso, W.A. Ritchie, I. Rouse, J. Rowe and D. Lathrap 1956 An archaeological classification of culture contact situations. *American Antiquity* 22:3–30.
- Williams, J.K. 1997a Tor Aeid, an Upper Paleolithic site in southern Jordan. In *The Prehistory of Jordan, II. Perspectives from 1997*, edited by H.-G. Gebel, Z. Kafafi and G.O. Rollefson, pp. 137–148. SENEPSE 4, ex oriente, Berlin.
- Williams, J.K. 1997b *A Lithic Examination of Tor Aeid: A Middle and Upper Paleolithic Rockshelter in Southern Jordan*. Unpublished MA Thesis, University of Tulsa, Tulsa.
- Williams, J.K. 2000 Land use and technological trends in the Levantine Upper Paleolithic. *Mitekufat Haeven – Journal of the Israel Prehistoric Society* 30:33–48.
- Wolf, C.A. 1988 Analysis of faunal remains from early Upper Paleolithic sites in the Levant. In *The Early Upper Paleolithic, Evidence from Europe and the Near East*, edited by J.F. Hoffecker and C.A. Wolf, pp. 73–95. BAR International Series 437, Oxford.
- Wolf, E. 1982 *Europe and the People Without History*. University of California Press, Berkeley.
- Woodward, J.C. and P. Goldberg 2001 The sedimentary records in Mediterranean rockshelters and caves: archives of environmental change. *Geoarchaeology* 16:327–354.
- Wreschner, E. 1976 The red hunters: further thoughts on the evolution of speech. *Current Anthropology* 17:717–719.
- Wurz, S. 1996 The Howiesons Poort backed artifacts from Klasies River: an argument for symbolic behavior. *African Archaeological Bulletin* 54:38–50.
- Yagodin, V.N. 1998 ‘Arrow-shaped’ structures in the Aralo-Caspian steppe. In *The Harra and the Hamad. Excavations and Surveys in Eastern Jordan, vol. 1*, edited by A.V.G. Betts, pp. 207–223. Sheffield Academic Press, Sheffield.
- Yalçinkaya, I. and M. Otte 1999 1998 Karain Kazısı. *XXI Kazı Sonuçları Toplantısı*. T.C. Kültür Bakanlığı Anıtlar ve Müzeler Genel Müdürlüğü, Ankara.
- Yalçinkaya, I., Otte, M., Bar-Yosef, O., Kozłowski, J., Leotard, J.-M. and H. Taşkıran. 1992 Karain 1991, Recherches Paléolithiques en Turquie de sud: rapport provisoire. *Paléorient* 18:109–121.
- Yalçinkaya, I., J.-M. Leotard, M. Kartal, M. Otte, O. Bar-Yosef, I. Carmi, A. Gautier, E. Gilot, P. Goldberg, J. Kozłowski, D. Lieberman, I. Lopez Bayon, M. Pawlikowski, S. Thiebault, V. Ancion, M. Patou, A. Emery-Barbier and D. Bonjean 1995 Les occupations Tardiglaciaires du site D’Öküzeni (sud-ouest de la Turquie) Résultats préliminaires. *L’Anthropologie* 99:562–583.
- Yellen, J.E. 1991a Small mammals: !Kung San utilization and the production of faunal assemblages. *Journal of Anthropological Archaeology* 10:1–26.
- Yellen, J.E. 1991b Small mammals: post-discard patterning of !Kung San faunal remains. *Journal of Anthropological Archaeology* 10:152–192.
- Ziffer, D. 1978 A re-evaluation of the Upper Paleolithic industries at Kebara Cave and their Place in the Aurignacian Culture of the Levant. *Paléorient* 4:273–293.
- Ziffer, D. 1981 Yabrud Shelter II – A reconsideration of its cultural composition and its relevance to the Upper Palaeolithic cultural sequence in the Levant. *Quartär* 31–32:69–91.
- Zilhão, J. and F. d’Errico 1999 The chronology and taphonomy of the earliest Aurignacian and its implications for the understanding of Neanderthal extinction. *Journal of World Prehistory* 13:1–68.

More Than Meets The Eye

*Studies on Upper Palaeolithic
Diversity in the Near East*

Edited by

A. Nigel Goring-Morris and Anna Belfer-Cohen

Oxbow Books

Published by
Oxbow Books, Park End Place, Oxford OX1 1HN

Oxbow Books and the individual authors, 2003

ISBN 1 84217 082 1

A CIP record for this book is available from The British Library

This book is available direct from
Oxbow Books, Park End Place, Oxford, OX1 1HN
(Phone: 01865-241249; Fax: 01865-794449)

and

The David Brown Book Company
PO Box 511, Oakville, CT 06779, USA
(Phone: 860-945-9329; Fax: 860-945-9468)

and

via our website
www.oxbowbooks.com

Front cover: Refitted core from Nahal Nizzana XIII (photo: Z. Rudovan)
Back cover: top, Advat area with Boker Tachtit and Boqer; bottom, Ohalo II (photo courtesy of D. Nadel)

Printed in Great Britain at
The Short Run Press
Exeter