

to observe several occupation layers behind and partially destroyed by the Wall. A black-and-white mosaic had been overlaid with rough paving, and a mud-brick wall, with eight or nine well-preserved courses, resting on five courses of stone, must belong to a house on this site, the wall itself having partially collapsed towards the end of the 5th or the beginning of the 6th century. Further digging is needed to elucidate the relationships of the structures involved. This whole area had been sealed by massive layers of fill in the 7th century or later, and there were remains of two superimposed pavements, possibly of the Islamic period, on top of this fill.

There was no digging on the site in 1977, but a month was devoted to further work on the material from the 1976 excavations. The pottery was under the responsibility of Lucinda Neuru (McMaster University); the coins were studied by Roger Blockley (Carleton University). Wells and Wightman also took part in a meeting for *chefs d'équipe* of the Carthage teams organised by the Tunisian archaeological authorities.

The 1978 excavations will occupy the months of June and July. They will concentrate on obtaining more information about the line of the Theodosian Wall and about the layout and development of the street system in this area, as well as examining further the nature of certain features already uncovered in

1976, such as the mud-brick wall referred to above and a cistern uncovered in the last days of the 1976 dig to the north of the house, in the angle of *cardo* III and *decumanus* VI, which must be brought into relationship with the Wall and street system.

We propose also to carry out an intensive field survey along the Teurf el-Sour, where numerous features are visible in the eroded scarp, and in the fields north and south of it. We should like specifically to fix on the ground *cardines* IV to VII east and to survey in all visible features associated with the street system or the Theodosian Wall.

Further information may be had from Colin Wells, Department of Classical Studies, University of Ottawa, Ottawa, Ont., Canada K1N 6N5, or from Edith Wightman, Department of History, McMaster University, Hamilton, Ont. Canada L8S 4L9.

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Holocene Prehistory and Environment in Eastern Algeria

by DAVID LUBELL

Department of Anthropology, Erindale College, University of Toronto, Mississauga, Ont., Canada L5L 1C6. 7 XII 77

Since 1972, we have been investigating the cultural ecology of Capsian occupation (ca. 10,000 to 6,000 B.P.) in eastern Algeria. To date, our work has been largely confined to the region around Chéria (southwest of Tébessa), for which a relatively complete gazetteer of Capsian sites is available (Grébénart 1976). In addition to archaeological excavations at one site (Ain Misteheyia) and tests at several others, our research has included study of geoarchaeology, regional and local geomorphology, and modern and Holocene plant and animal ecology.¹ Preliminary results are available (Lubell 1977; Lubell et al. 1975, 1976), and a monograph is in preparation. Further fieldwork is planned for 1978 and 1979.

Our research has proceeded on the basis of the following data: The land-snail species so characteristic of the Capsian escargotières were, at least until very recently, extant in the region (Baker 1938; Morel 1953, 1974). All these species aestivate during the summer and winter. While there has been both climatic change and environmental degradation during the Holocene (Couvert 1972; Rognon 1976; Lubell et al. 1975, 1976), it is likely that snails were only a seasonal resource for Capsian populations and did not constitute the major source of animal protein in the Capsian diet (cf. Gobert 1937). Sites containing Capsian lithic assemblages but lacking land snails are known to the south around Négrine, Biskra, and Ouargla

(Balout 1955, Grébénart 1976, Tixier 1976). We have hypothesized, therefore, that the escargotières in the Chéria region were either (a) occupied only seasonally by transhumant groups or (b) occupied sporadically throughout the year by small, highly mobile groups or possibly both (see also Romer 1938). The number of known sites (over 200) and their average density (0.1/sq. km) are too great to entertain a model of year-round occupation for any duration on the basis of known hunter-gatherer demography. While our results to date do not permit definitive conclusions about these hypotheses, the following observations can be made:

Capsian occupation in the region was apparently continuous from ca. 9,800 to 6,000 B.P. It began and ended under climatic conditions which were somewhat cooler and wetter than at present. From ca. 8,200 to perhaps 7,600 B.P. these conditions were interrupted by an interval of warmer and drier climate which has been identified over much of North Africa.

During this interval of greater aridity, the indigenous savanna parkland retreated and the numbers of large herbivores (hartebeest, aurochs, zebra) declined. In response, Capsian groups apparently increased their consumption of the smaller (i.e., less productive) land-snail species as well as the smaller mammals (especially lagomorphs), which are not well represented prior to ca. 8,200 B.P. in the sites we have studied.

We have calculated the ratio of land snails to mammals as a source of animal protein. Land snails constituted no more than 17% and probably a good deal less. We cannot, at present, estimate the contribution of vegetal food to the diet, but planned excavations at a site with well-preserved floral remains may provide these data.

The absence of nut kernels or shells (available in the fall) from reported Capsian sites in the region (and our own excavations) suggests the possibility that these sites were occupied only during the spring, but this remains a hypothesis.

Capsian sites in this region and elsewhere are most frequently open-air. Our geoarchaeological investigations (involving microstratigraphic study of both geochemistry and granulometry as well as rates of deposition) suggest that such sites have been seriously affected by postdepositional pedogenic compaction and leaching. On the basis of the one site we have investigated which is relatively undisturbed by these processes, we estimate

¹ This research has been made possible by grants from the Wenner-Gren Foundation for Anthropological Research (1972) and the Canada Council (1973 to present). I am grateful for the assistance and encouragement of the Centre de Recherches Anthropologiques, Préhistoriques et Ethnographiques and the Organisme National de la Recherche Scientifique, both in Algiers. I am especially grateful to my collaborators, A. Gautier, F. A. Hassan, J.-L. Ballais, and I. A. Campbell, and for the assistance of J. Archer, P. Bobrowsky, C. Chippindale, A. Close, D. Gay, E. Henrickson, R. Henrickson, B. Hodgson, J. Story, and P. R. Willoughby.

an average rate of accumulation approaching 50 cm/100 years and a compaction rate of up to 75% (i.e., 10 cm of deposit preserved today may represent ± 40 cm of original deposit). In the absence of preserved visible microstratigraphy in open-air sites (and its presence in a protected rock shelter), we are led to the tentative conclusion that occupation was sporadic by a small number of highly mobile groups, probably on a seasonal basis, although this remains to be demonstrated conclusively by further work.

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Magdalenian Habitation Structure at Tito Bustillo Cave (Asturias, Spain)¹

by JOSÉ A. MOURE ROMANILLO and MERCEDES CANO HERRERA
Departamento de Prehistoria, Universidad Complutense de Madrid, Madrid 3, Spain. 7 XII 77

The cave of Tito Bustillo, in Ribadesella, in the eastern part of the province of Asturias, Spain, opens 60 m above sea level at a distance of 500 m from the mouth of the Sella River and 750 m the coast. It is especially interesting because it contains a magnificent suite of Paleolithic paintings in association with vestiges of Magdalenian occupation.

The site was discovered in 1968 (Berenguer Alonso 1969, 1970, 1975; Mallo Viesca and Pérez y Pérez 1969; Moure Romanillo 1976), and first tested archeologically by M. A. García Guinea in 1970. During those investigations, prehistoric occupation residues were found in two zones: at the foot of the principal painted panel—with polychrome depictions of reindeer and horses—and in the primitive cave entry, sealed today by fallen blocks (García Guinea 1975).

Systematic excavations were conducted under our direction in 1972 and in 1974-77 (Moure Romanillo 1975a, Moure Romanillo and Cano Herrera 1976). The principal aims of our fieldwork are the intensive exploration of occupation levels in the primitive entry, the search for possible habitation structures, and the correlation of site deposits with the cave paintings (Moure Romanillo 1975b).

For the moment we recognize two stratigraphic complexes in the old entry; these include structural remnants:

Level 1. This level has three major subdivisions. 1a and 1b are the surface and the fill of an artificial pavement or structure floor. 1c is an immediately underlying horizon which may be an artificial fill forming part of the same structure. Artifacts, fauna, and absolute dates demonstrate that all these sublevels represent a single stage of industrial evolution: the Upper Magdalenian (fig. 1).

Level 2. This is a substantial deposit whose base has not yet been reached. Although there are sufficient distinctive archeological materials from this horizon to permit recognition that it is Magdalenian, it is not yet possible to be more precise.

Preliminary analysis of the lithic material was undertaken using the de Sonneville-Bordes and Perrot (1953-55) system. The similarity between the three subdivisions of Level 1 is obvious from a comparison of the indices in table 1. All three sublevels share several characteristics of the Cantabrian Upper Magdalenian: the predominance of burins (especially dihedral varieties) and of backed bladelets is especially indicative. The microblade index (Ih) is high, although geometric microliths and other elements common during the Final Magdalenian and its transition to the Azilian are still absent (Moure Romanillo 1970).

The bone industry is characterized by three principal tool groups: harpoons, bone points (sagaies), and semicylindrical wands. Harpoons, found throughout Level 1, are all unilaterally barbed; in Cantabria such pieces are always much more abundant than bilaterally barbed harpoons (González Echeagaray, García Guinea, and Begines Ramírez 1963:45-47). The most common bone point type has a circular cross-section and a single-bevelled base, and among the pieces are several short, thick points with deep dorsal channels, like pieces typical of the Magdalenian III in southwestern France. The semicylindrical wands are also similar to Magdalenian III pieces in the type region. These observations might indicate that the Tito Bustillo horizons are not evolved Upper Mag-

TABLE 1
 ANALYSIS OF LITHIC MATERIAL BY SUBLEVEL

INDEX	SUBLEVEL		
	1a	1b	1c
IG.....	10.9	9.4	5.5
IB.....	22.1	19.6	18.5
IGA.....	2.0	2.0	1.5
IBd.....	10.5	14.2	10.6
IBt.....	7.1	2.0	3.5
IBdr.....	47.6	72.4	57.5
IBtr.....	32.3	10.3	16.4
GA.....	3.4	4.7	3.5
GP.....	28.3	33.5	47.8
Ih.....	28.6	31.5	48.0

NOTE: Indices are as defined by de Sonneville-Bordes and Perrot (1953-55).

¹ Translated by L. G. Freeman.