Eyal 23 – a lower palaeolithic site in the eastern Sharon, Israel

by Avraham Ronen and Yuval Winter, Haifa***

Location

The term Sharon designates the central part of the Mediterranean Coastal Plain of Israel, from Mount Carmel in the north to the Yarkon River in the south. The Pleistocene sediments here, as elsewhere along the coastal plain, consist mainly of sands and interbedded red loams (Yaalon and Dan 1967, Karmeli et al. 1968). The Sharon contains two longitudinal zones: the western is characterised by regular ridges of cemented sand dunes (= Kurkar) running parallel to each other and to the present shoreline. The eastern zone is a rolling country of low hills.

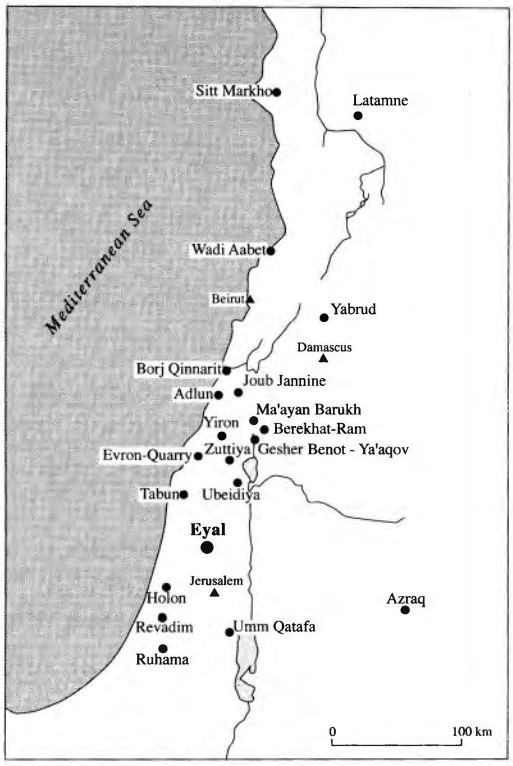


Fig. 1. Major Lower Palaeolithic sites in the Levant.

* Zinman Institute of Archaeology, University of Haifa, Haifa 31905, Israel
** Sheerit Hapleta Str. 67, Haifa 34987, Israel

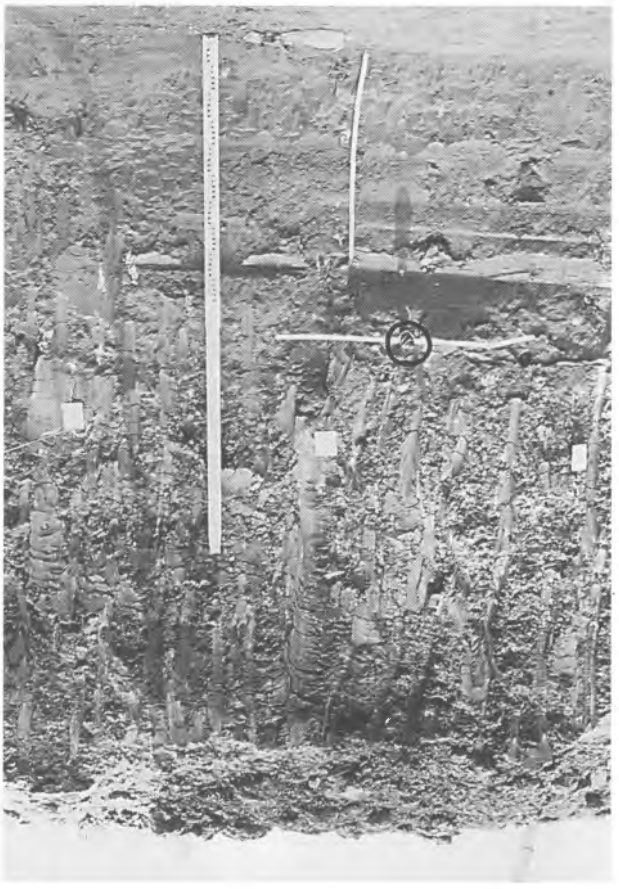


Fig. 2. Eyal 23, Stratigraphy seen in the west wall of excavation. The circled peg is 64.0 m asl. Vertical scale is two meters.

The site is located on a hill 67.5 m amsl (Israel grid 146.6/179.2) west of Kibbutz Eyal on the eastern edge of the Sharon coastal plain, close to the Samaria mountains (Fig. 1). The Quaternary sediments here are only some 25 m thick above the pre-Neogenic limestone and dolomite of the Judean Group, as against ca. 200 m in the western coastal plain (Issar 1968). This site is known through regional surveys carried out in the 60's, when handaxes and flake tools of Upper Acheulian were recovered on the surface. The surface finds, assumed to derive from a burried archaeological horizon, apparently became exposed through erosion and agricultural activities. Future construction of a highway on the eastern slope of the hill necessitated rescue excavations along the planned E-W path of the highway, aimed to locate the assumed undisturbed layer. A set of test trenches was dug in January 1996, followed by a three-week excavation in July 1996. The trenches revealed *in situ* remains of low density in the higher half of the eastern slope. No in-situ finds were revealed in the lower part of the slope. Excavation opened where finds seemed most abundant, around 65 m asl (Fig. 8; 1).

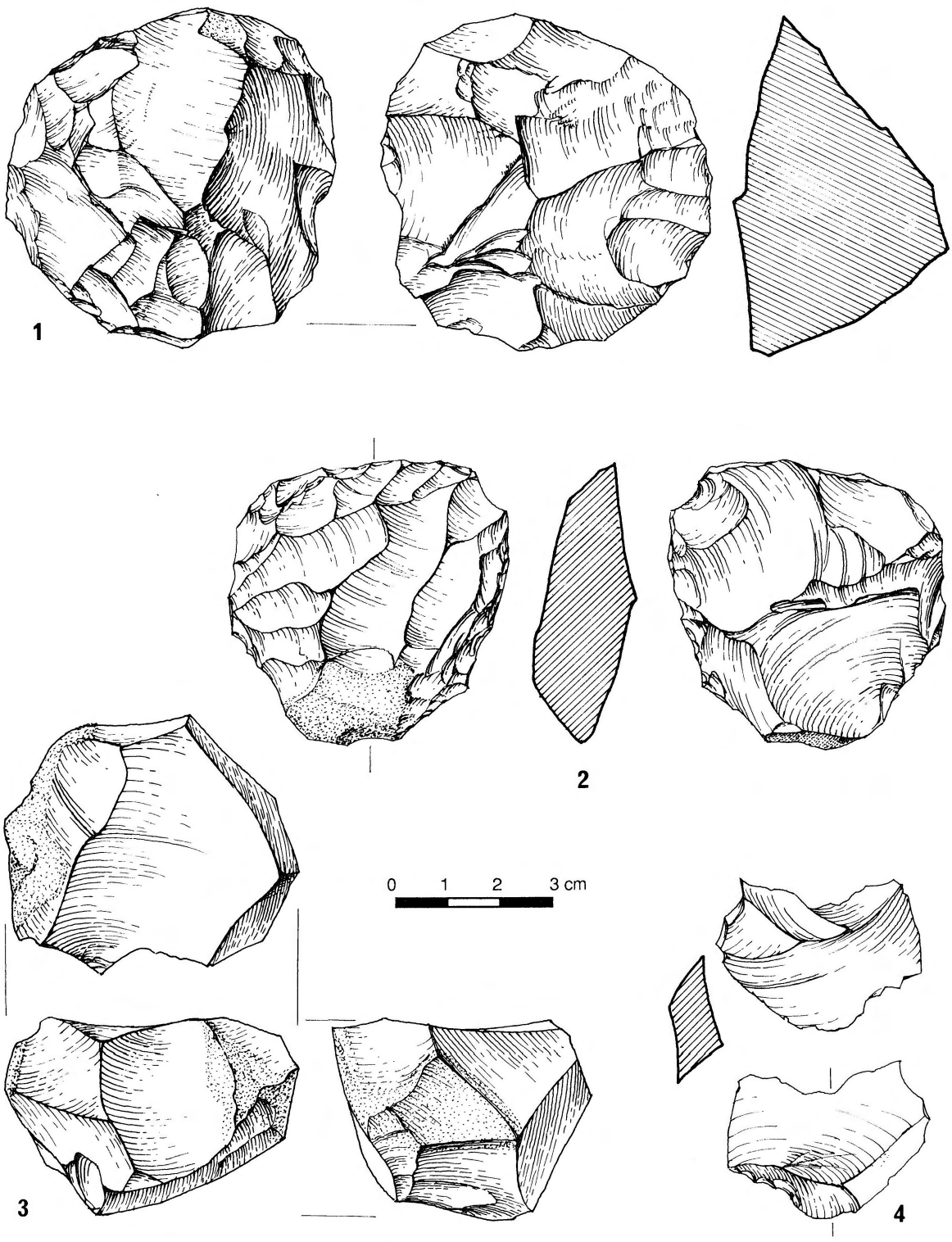


Fig. 3. Eyal 23, lithic industry of Horizon 1.

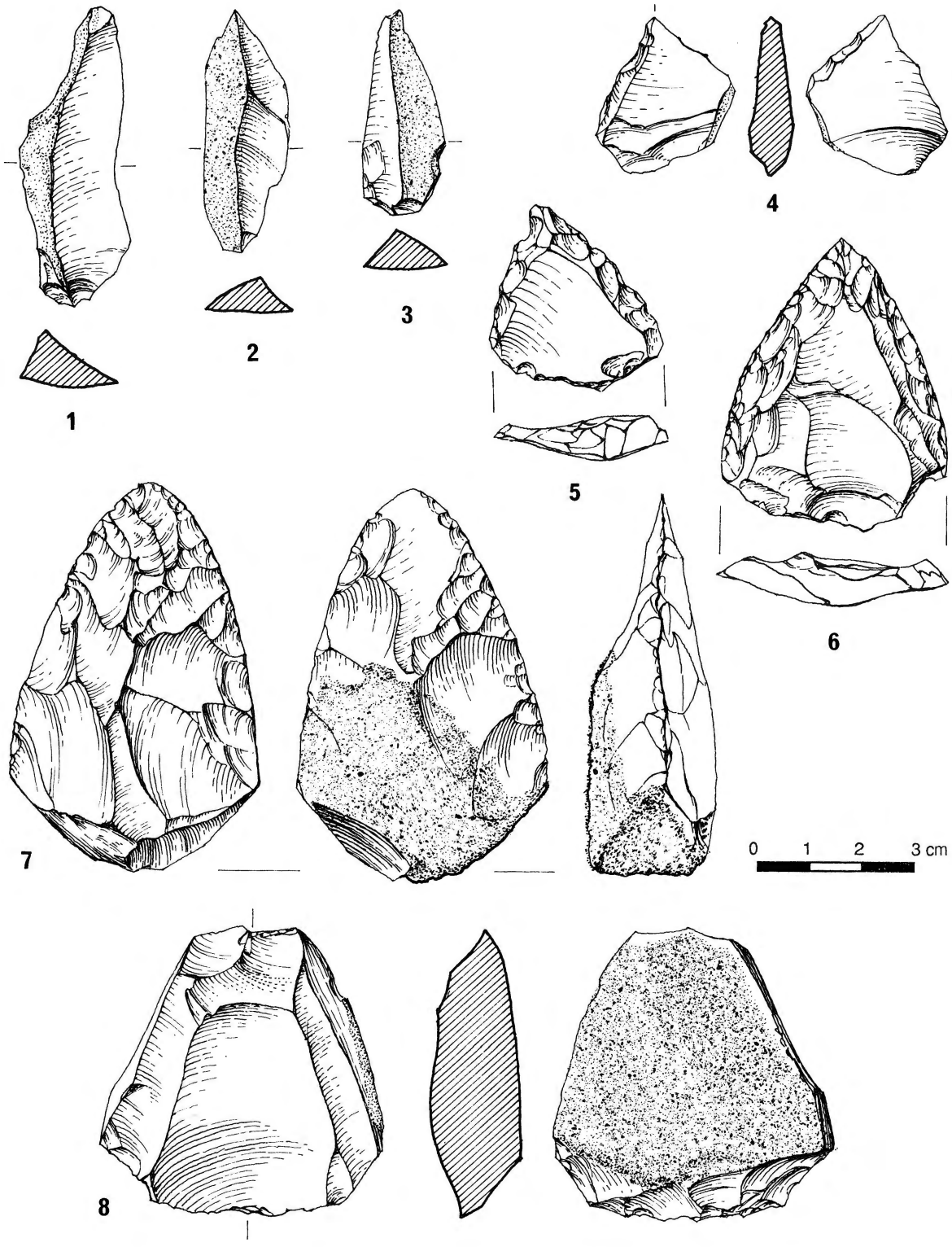


Fig. 4. Eyal 23, lithiy industry of Horizon 1.

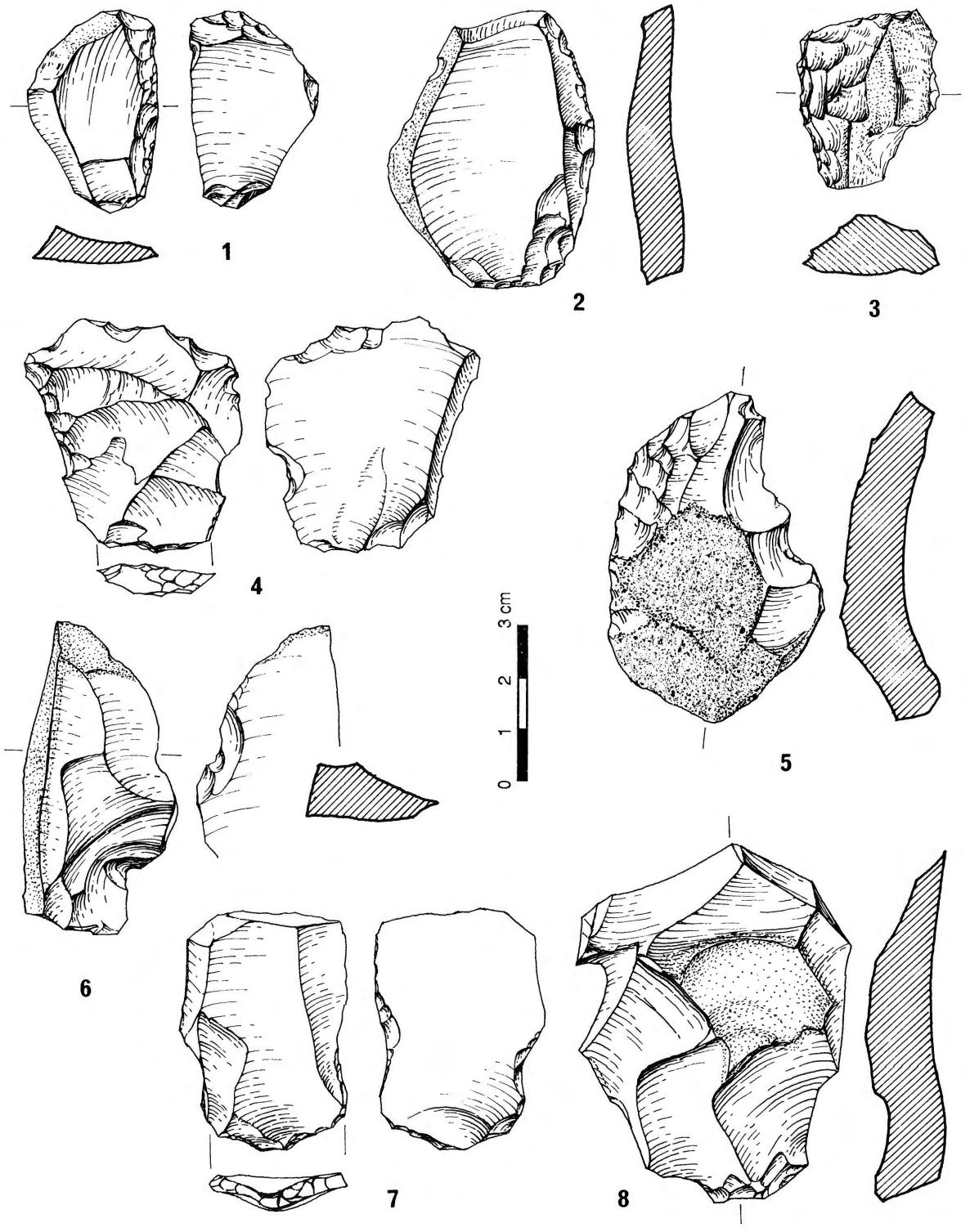


Fig. 5. Eyal 23, lithiy industry of Horizon 1.

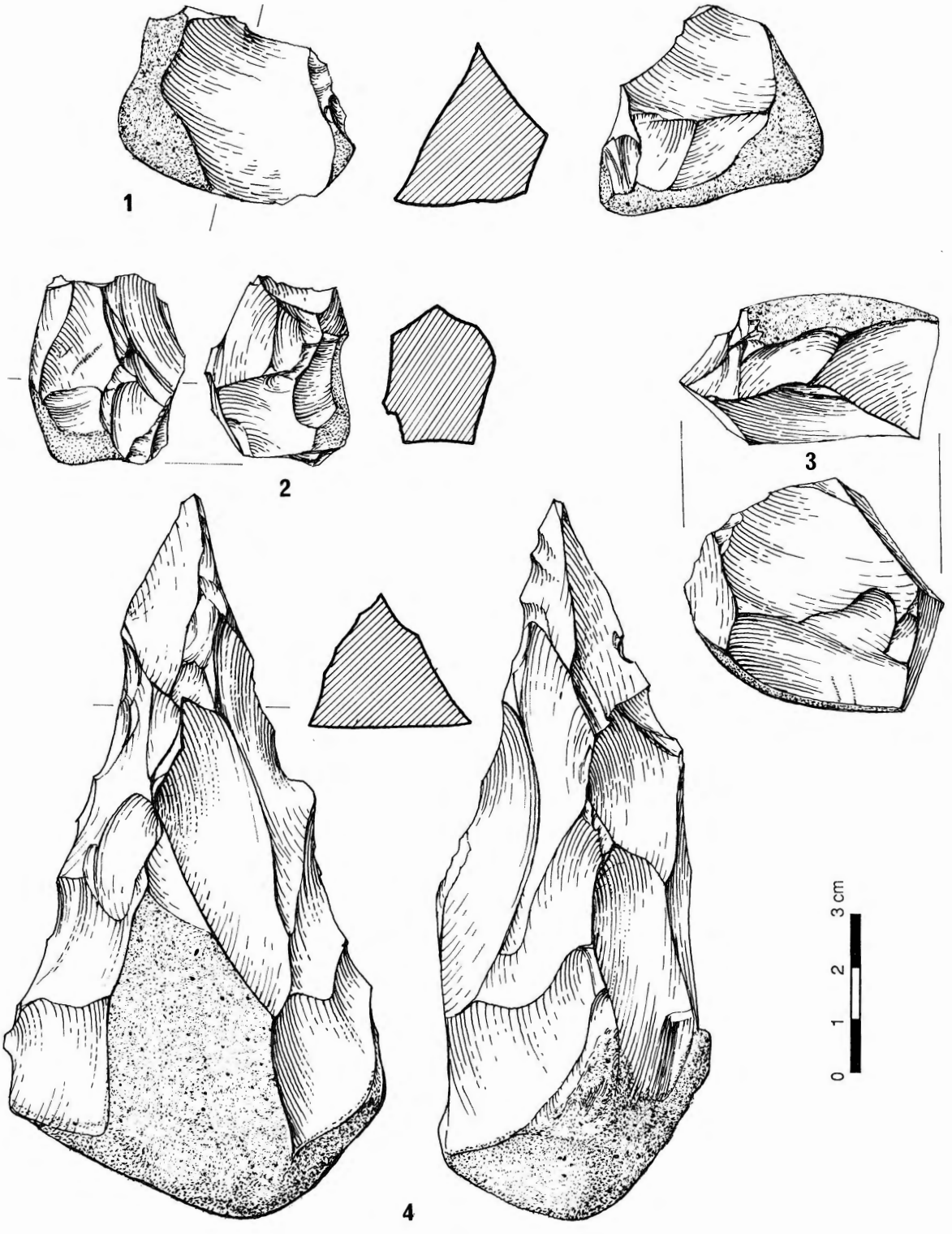


Fig. 6. Eyal 23, lithiy industry of Horizon 2.

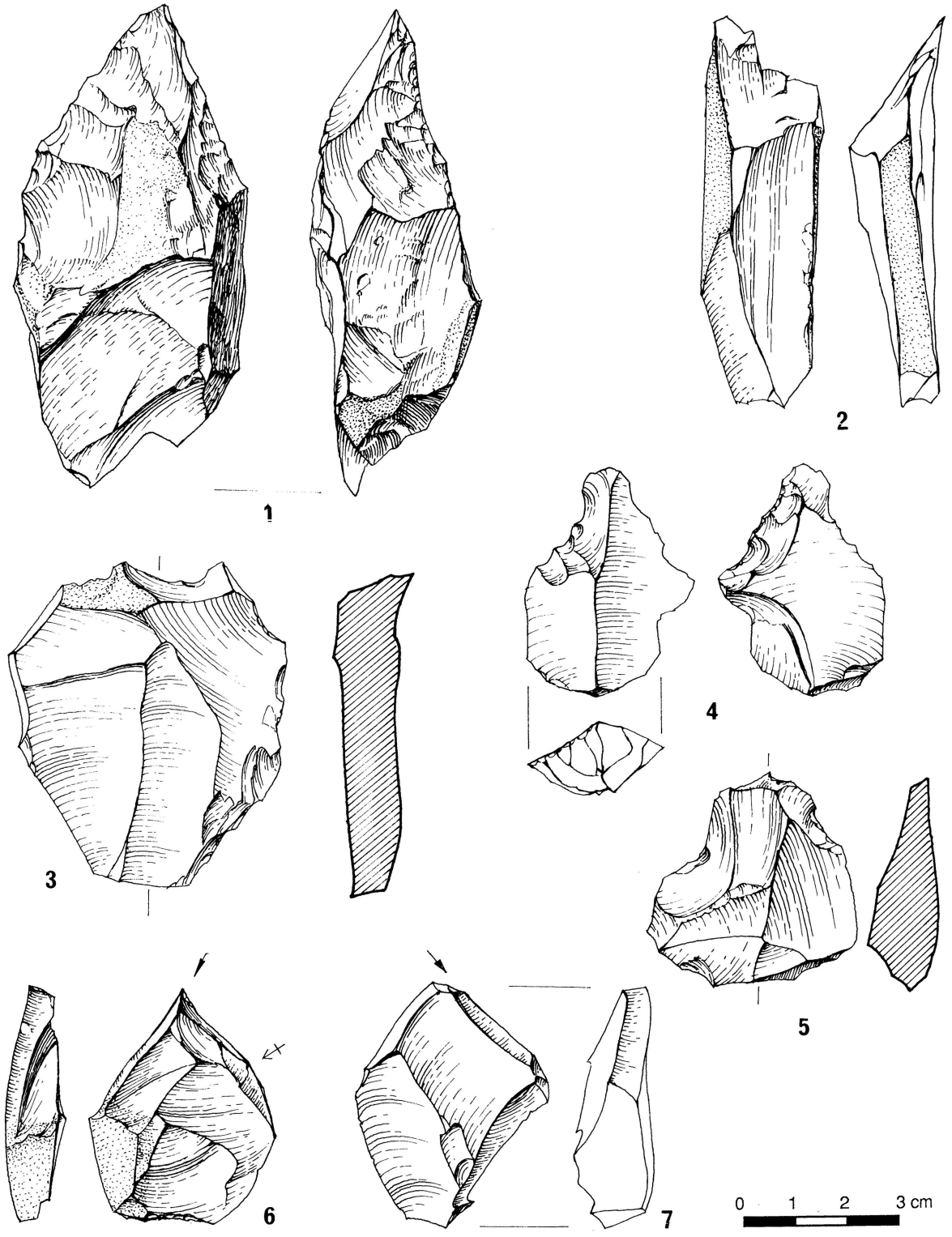
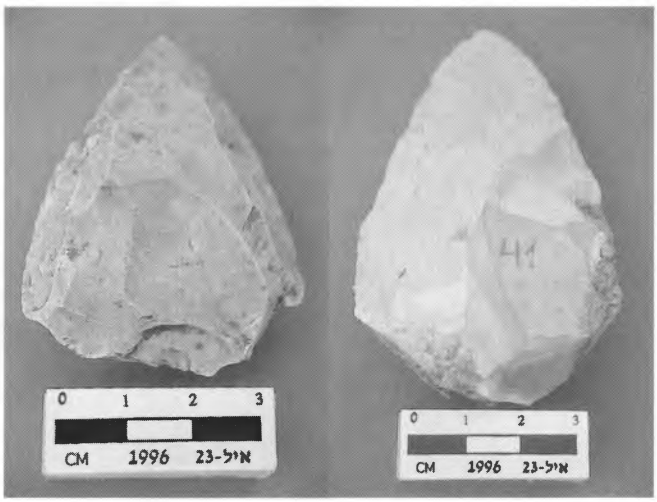


Fig. 7. Eyal 23, lithiy industry of Horizon 2.



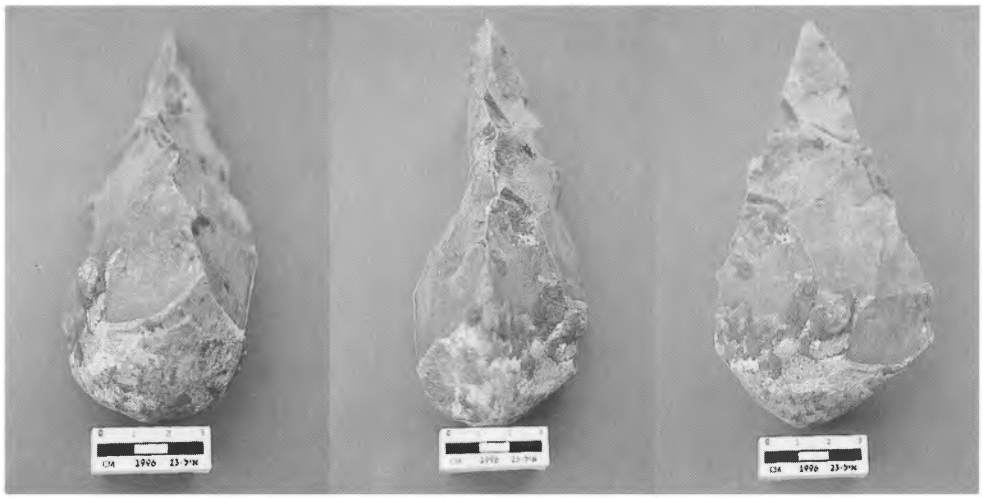


Fig. 8. Eyal 23, 1. Excavation area, view to west; 2. Mousterian point of Fig. 4, 6; 3. Handaxe of Fig. 4, 7; 4-6. Three views of the Trihedral of fig. 6, 4.

Stratigraphy

From top (Fig. 2):

A. Gray-brown grumusol 1.5-1.8 m thick. This layer thinned out with elevation, almost disappearing near the top of the hill, and became much thicker in the lower part of the hill. The grumusol is subdivided into:

A1. Top brown soil (10YR4/3) 50 cm thick, clay matrix with subangular fine quartz sand particles.

A2. A dark grayish-brown clay (10YR3/1-10YR3/4) 1.3 m thick, with calcitic concretions. The lower 0.8 m is mottled by unlithified white lime concretions typically 3 cm in diameter.

A3. A reddish-brown (5YR4/4) mixture of brown clay, reddish-brown silt and red quartz sand grains, 0.3 m thick. This is a transition zone between layers A and B (C horizon of Layer A?).

B. A red sandy soil (Hamra, 2.5YR3/6) 0.6 m thick, very hard, subrounded quartz sand grains consolidated by a reddish silty matrix. Few black spots of manganese oxide and a few large, vertical calcite concretions, possibly filling roots' cavities.

C. Bottom dark red Hamra (2.5YR3/6+2.5YR4/6), ca. 1 m visible thickness to the base of excavation. This soil has a higher silt and clay content, and is less hardened, than the overlying soil of layer B. The transition between the two red soils is not easily distinguishable. Excavation reached a total depth of 3.7 m, to elevation 62.4 m amsl.

Industry

We were looking for an archaeological layer *in situ*; instead, three layers were found: the uppermost is at the junction between the grumusol and upper red loam, layers A and B above. A second cultural horizon was found in the transition zone between the two red soils, layers B and C above. A third layer may exist still lower, some 0.4 m deeper in the lower red soil C. The finds in all layers consist solely of flint artifacts. Bone was unfortunately not preserved. The great majority of artifacts in all layers were found in a horizontal position, thus apparently without any considerable erosional displacement. Only a small number of artifacts came from the lowermost horizon, and further research is needed to verify its nature. The middle and upper horizons, although not very rich at the moment, already provide some clues as to their techno-typological composition.

Archaeological horizon 1 (Upper)

It has a thickness of ca. 0.2 m in the top part of the upper red soil B, apparently preceding the accumulation of the surface grumusol A. It is as yet not clear whether an archaeological horizon is embedded in the brown grumusol. At present, the few artifacts recovered in the grumusol, or on the surface, are viewed as part of Archaeological Horizon 1, though they do not figure in Table 1.

Horizon 1 has relatively small handaxes of fine manufacture (Fig. 4, 7 and Fig. 8, 3, surface find), Levallois preparation mode on cores (Fig. 3, 8) and flakes (Fig. 5, 4.7.8) and a common use of facetage

(Fig. 4, 5.6; Fig. 5, 4.7). The retouched pieces are not distinguishable from Middle Palaeolithic ones. There is one retouched Levallois point (a surface find, not figured) and a superb Mousterian point (Fig. 4, 6 and Fig. 8, 2, a surface find). The tools in the excavated series consist mainly of racloirs (Fig. 4, 5; Fig. 5, 1.3.5), followed by notches and denticulates (Fig. 5, 4.6.7) and retouched pieces (Fig. 5, 2.4). Natural backed knives are relatively numerous (Fig. 4, 1-3). The cores are carefully prepared (Fig. 3, 1-3, no. 2 with blade removals). Waste flakes constitute an important part of the assemblage, indicating local manufacture. Flakes and waste flakes together constitute ca. 60% of the assemblage.

Horizon 1 has the typical assemblage found in other sites in the eastern coastal plain and refered to as „Upper Acheulian" (Gilead 1970, Ronen et al. 1972, Ronen 1975, Gilead and Ronen 1977). The industry is similar to Upper Acheulian occurrences elsewhere (e.g. Berechat Ram, Goren-Inbar 1985).

Archaeological Horizon 2 (Middle)

This occupation is 0.2 - 0.3 m thick in the transition zone between layers B and C and in the upper part of C. The small assemblage of this horizon is very different from that of horizon 1. Technologically, there is no Levallois preparation and very few faceted pieces. The cores are simple globular ones (Fig. 6, 1-3), and there is nothing that approaches the elaborate cores of Horizon 1 (Fig. 3, 1.2). Typologically, horizon 2 has a far smaller variety of tool types than horizon 1, but it should be born in mind that the number of types may be related to the size of the sample. The small toolkit of Horizon 2 is governed by notches (Fig. 7, 5). There are two atypical burins (Fig. 7, 6.7), one denticulate (Fig. 7, 4), a retouched/utilised flake (Fig. 7, 3) and a backed knife (Fig. 7, 1) similar to the Bockstein type (Bosinski 1967).

The assemblages of Horizon 1 and 2 have in common a relatively important proportion of flakes and waste flakes - 60% in the upper and as much as 75% in the lower horizon. In both assemblages blades are rare. Broken items, on the other hand, are quite numerous in both series, 18% and 10%. This is a noticeable phenomenon since the soil in which the assemblages are found contains virtually nothing which may cause breakage; hence it must be related to the pattern of use. Finally, both assemblages share a similar proportion of cores, ca. 10%.

A unique trihedral handaxe (Fig. 6, 4 and Fig. 8, 4-6) was recovered *in situ*, in a horizontal position, in Horizon 2. It is of a type not found in the Upper Acheulian. This handaxe type characterises the lower Acheulian of Ubeidiya (Bar-Yosef and Goren-Inbar 1993, 53-55), but the Ubeidiya specimens are far coarser than that of Eyal. On typological grounds, horizon 2 of Eyal should be placed between Ubeidiya and the Upper Acheulian.

Archaeological Horizon 3 (Lower)

A few flakes were found in a one square meter test excavation, 0.3-0.4 m below Horizon 2. The sediment between horizons 2 and 3 appears to be sterile. The flakes lie horizontally in the soft red soil of layer C. The characteristics of this industry, and the thickness of the horizon could not be determined. The size of the artifacts, however, is similar to that of the two upper horizons.

Table 1. The Assemblages of Horizons 1 and 2 (in parentheses, percent).

All Finds	Horizon 1	Horizon 2
Flakes	111 (46.8)	76 (53.8)
Waste Flakes	33 (13.9)	30 (21.2)
Blades	4 (1.7)	2 (1.4)
Cores	31 (13.0)	13 (9.2)
Fragments	43 (18.1)	15 (10.6)
Varia	13 (5.5)	5 (3.5)
Total	237 (99.0)	141 (99.7)
Tools		
Racloirs	5	
Awl	1	
Burin		2
Denticulate	4	1
Notch	2	4
Backed knife	5	1
Pseudo-Levallois point		1
Retouched piece	7	1
Hammerstone	1	
Trihedral		1
Total	25	11

Discussion

Eyal 23 is outstanding among the sites of the coastal plain by having three superimposed Lower Palaeolithic layers. It is still not clear if an archaeological layer exists in the upper grumusol, Layer A at Eyal. This will be clarified by further research. At present it seems that the Upper Acheulian of Horizon 1, at the top of Layer B, is the youngest archaeological bed here. This shows, once again, that the red soils of the eastern coastal plain are older than the red soils of the western coastal plain (contra Sivan 1996). The dividing line is the „Third Sandstone Ridge" (Gilead 1969, Ronen 1975). West of this line, the red soils contain industries of either Middle Palaeolithic or Epi-Palaeolithic, never Lower Palaeolithic (Farrand and Ronen 1974, Ronen 1977, 1995). Lower Palaeolithic industries are only contained in red soils east of that line.

Horizon 1 at Eyal conforms to the Upper Acheulian assemblages known all along the coastal plain, whether surface sites or embedded in the uppermost bed (Lamdan et al. 1977, Ronen et al.1972, Ronen and Amiel 1974). Antedating Horizon 1, and in all likelihood post-dating Ubeidiya, Horizon 2 of Eyal may be considered a Middle, or Early-Upper Acheulian. The precise stratigraphical position within the Acheulian complex is difficult to ascertain, as the temporal relation between the red loams of the coastal plain and the Quaternary formations in the Jordan Valley are far from clear. The situation is even more complicated by the fact that the industry of Horizon 2 at Eyal differs greatly from other pre-Upper Acheulian industries embedded in ancient red soils in the eastern coastal plain. These industries are characterised, above all, by their small size (Evron-Quarry, Ronen 1991) or even very small size (Ruhama, Ronen et al, nd), unlike horizons 2 and 3 at Eyal. The subdivision of the Acheulian and its facies in the Levant is still poorly known.

Acknowledgments

We thank Dr. H. Michelson of TAHAL-Israel Water Planning, for information concerning sub-surface Quaternary stratigraphy in the area of the site. Thanks are also due to Kibbutz Nir Eliyahu for providing room and board during the excavations. Ms. Anat Efenberger and Mr. Ayman Safadi were field directors. Cross Israel Highway Ltd. kindly financed the project.

Bibliography

Bar-Yosef, O., and Goren-Inbar, N, 1993: The Lithic Assemblages of Ubeidiya. Qedem 34.

Bosinski, G., 1967: Die Mittelpalaolithischen Funde im westlichen Mitteleuropa. Fundamenta A/4.

Farrand, W., and Ronen, A., 1974: Observations on the Kurkar-Hamra Succession on the Carmel Coastal Plain, Israel. Tel Aviv 1, 45-54.

Gilead, D., 1969: Early Palaeolithic Cultures in Israel and the Near East. Unpublished Ph.D., Hebrew University, Jerusalem.

–, 1970: Handaxe industries in Israel and the Near East. World Archaeology 2, 1-11

Gilead, D., and Ronen, A., 1977: The Acheulean industries of Evron, Western Galilee Coastal Plain, Israel. Eretz-Israel 13, 56-86.

Goren-Inbar, N., 1985: The lithic assemblages of Berechat Ram Acheulian site, Golan Heights. Paléorient 11, 7-28.

Issar, A., 1968: Geology of the Central Coastal Plain of Israel. Israel J. Earth-Science 17, 16-29.

Karmeli, D., Yaalon, D.H., and Ravina, I., 1968: Dune sand and soil strata in Quaternary sedimentary cycles of Sharon coastal plain. Israel J. Earth Science 17, 45-53.

Lamdan, M., Ziffer, D., Huster, J., and Ronen, A., 1977: Prehistoric Archaeological Survey of Nahal Shiqma. Regional Council Shaar Hanegev (Hebrew).

Ronen, A., 1975: The Paleolithic Archaeology and Chronology in Israel. in: Wendorf, F., and Marks, A.E. (eds), Problems in Prehistory: North Africa and the Levant, pp. 229-248. SMU Press, Dallas.

–, 1977: Mousterian Sites in Red Loam in the Carmel Coastal Plain. Eretz Israel 13, 183-190.

–, 1991: The Lower Palaeolithic Site Evron-Quarry in Western Galilee, Israel. Festschrift Karl Brunnacker, Geological Institute Köln 82, 187-212.

–, 1995: The Levallois method as a cultural marker. in: Dibble, H.L. and Bar-Yosef, O. (eds), The Definition and Interpretation of Levallois Technology, pp. 293-304. Prehistory Press, Madison.

Ronen, A., Gilead, D., Shachnai, E., and Saul, A., 1972: Upper Acheulean in the Kissufim Region. Proc. Am. Phil. Soc. 116, 68-96.

Ronen, A. and Amiel, A., 1974: The Evron Quarry: A Contribution to the Quaternary Stratigraphy of the Coastal Plain of Israel. Paléorient 2, 167-173.

Ronen, A., Burdukiewicz, J.M., Laukhin, S.A., Winter, Y., Tsatskin, A., Dayan, T., Kulikov, O.A., Vlasov, V.K., and Semenov, V.V., nd The lower Palaeolithic site Bizat Ruhama in the northern Negev, Israel.

Sivan, D., 1996: Palaogeography of the Galilee Coastal Plain during the Quaternary. Geological Survey of Israel 18/96.

Yaalon, D., and Dan, J., 1967: Factors controlling soil formation and distribution in the Mediterranean coastal plain of Israel during the Quaternary. INQUA 1965, vol. 9, 322-338.