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THE MUGHARAN TRADITION RECONSIDERED

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Introduction

Jelinek's concept of "Mugharan Tradition" is reviewed. The temporal scope originally proposed for the Mugharan tradition would span the entire pre-Mousterian sequence in Tabun Cave, including, from top, the Yabrudian, Amudian and Acheulian cultures. Here we show that contrary to Jelinek's assumptions, the Acheulian of Tabun (Garrod's layer F) was not attained in his excavations. Hence, the concept of Mugharan Tradition bears solely on the Yabrudian/Amudian part of the Tabun sequence.

Following D. Garrod's excavations (1929-34), the lithic assemblages in Tabun cave are known to contain, from the base upward, Tayacian, Acheulian, Yabrudian (Rust 1950), Amudian (Garrod 1956) and Mousterian cultures (Garrod & Bate 1937). Garrod excavated the central chamber of Tabun and left her main stratigraphical section (E-W) in the southern end of the chamber (figs. 1 and 2). The central part of Garrod's main section was re-excavated by Jelinek (1967-1972) (fig. 3) (Jelinek *et al.* 1973). The excavation stretched from around Garrod's Datum line down to 10 m below datum. The geological/stratigraphical colomn exposed by Jelinek was divided into 14 major units (Jelinek *et al.* 1973) (fig. 4). Units I through IX correrspnd to Garrod's Mousterian. Units X – XIII correspond to Garrod's Yabrudian and Amudian. Unit XIV, Jelinek's lowest, could not be easily fitted into Garrod's sequence (Jelinek *et al.* 1973:173).

Unit XIV is a compact whitish sediment 2.5 m thick on the west side of the swallow hole (fig. 6) with no visible counterpart elsewhere in the cave. In Garrod's view, this sediment formed the basal part of her layer E, the Yabrudian (fig. 4). A major unconformity separates Unit XIV from the overlying Unit XIII (fig. 5). In view of this major unconformity, Jelinek excluded Unit XIV from the overlying part of layer E and assigned it, alternatively, to Garrod's layer G (Tayacian) and later, to her layer F (Acheulian). Unit XIV was even considered to have no counterpart in Garrod's sequence (Jelinek *et al.* 1973:173).

There were two difficulties in assigning Unit XIV to Garrod's layer G. One difficulty was that Layer G around the swallow hole is ca. 2.5 m lower than Unit XIV slightly to the west (figs 6 and 7). To resolve this altimetric difficulty, Jelinek proposed that a subsidence (tectonical?) occurred east of Unit XIV, leaving unit XIV in its original position (Jelinek *et al.* 1973:173). The other difficulty was the lithic assemblage. According to Garrod, the Tayacian of Layer G contained no bifacial implements while Unit XIV did contain bifaces. This typological discrepancy was apparently resolved when Jelinek discovered a few bifacial artifacts in a Cambridge museum drawer assigned to Tabun Layer G (Jelinek 1982a:1375). In Jelinek's eyes, this museum evidence outweighed both Garrod's field observations (Garrod & Bate 1937:89) and Neuville's observations at Umm-Qatafa (Neuville 1951:35) where the Tayacian assemblages also contained no bifacial implements. With Garrod's Layer G now considered by Jelinek Acheulian, Jelinek concluded that Unit XIV was part of Tabun's Acheulian (Jelinek 1982:67)

The Mugharan Tradition

Analysing the lithic assemblages unearthed by him, Jelinek concluded that units XI through XIV, comprising as he believed the Acheulian, Yabrudian and Amudian, form a single cultural tradition. Jelinek proposed to name the new tradition "Mugharan", from Wadi el-Mughara (=valley of the caves) where Tabun is located. The Mugharan tradition would consist of a lithic industry with fluctuating ratios of handaxes, racloirs and blades (fig. 8) (Jelinek 1982) forming three more or less distinct facies. The biface-rich assemblages were termed Mugharan of Acheulian facies, the racloir-rich ones, Mugharan of Yabrudian facies and the blade-rich assemplage became Mugharan of Amudian facies. The techno-typological facies within the Mugharan Tradition would reflect, according to Jelinek, adaptation to changing climatic conditions with the handaxe-rich, Acheulian facies appearing during cold periods and the racloir-rich, Yabrudian facies during warm periods (Jelinek 1982a:1373). The adaptation of the blade-rich Amudian facies was not specified.

According to the presently known chronology of Tabun deposits (tab. 1), the time slot alloted for the Mugharan in Jelinek's model is between about 600 and ca. 250 ka BP (Grün & Stringer 2000; Laukhin *et al.* 2000; Mercier *et al.* 2000; Mercier & Valladas 2003; Rink *et al.* 2004; Coppa *et al.* 2005). We are not concerned here with the techno-typological considerations at the base of

Figure 1 - Tabun Cave 2008 (photo A. Ronen).

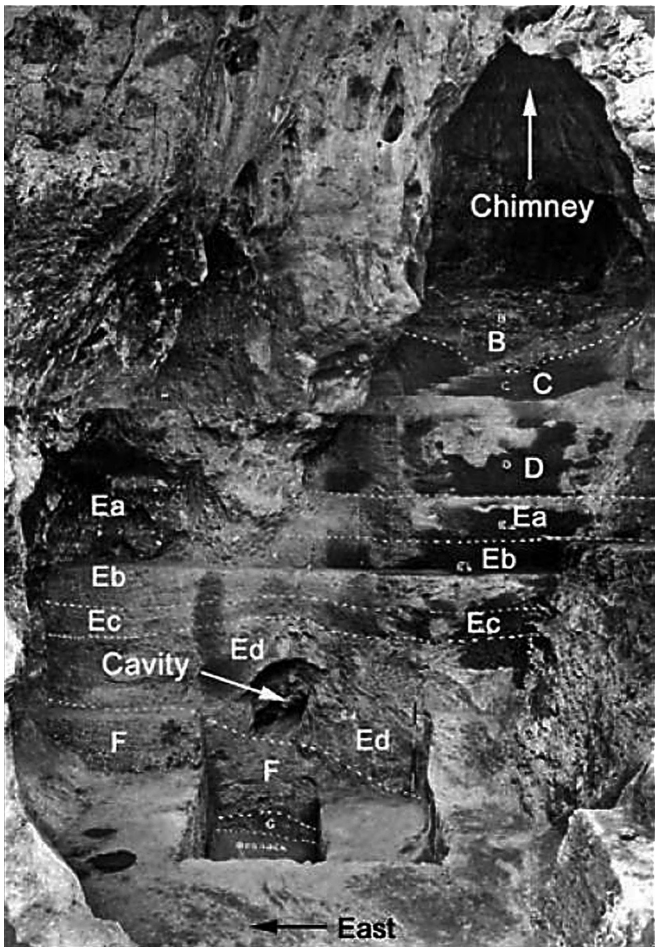

Figure 2 - Garrod's main profile 1934 (Garrod & Bate 1937).

Jelinek's model. We examine the place of Unit XIV in Jelinek's model and the alleged inclusion of the Acheulean in the Mugharan Tradition.

Unit XIV

Following Jelinek, the excavation of Tabun was undertaken by Ronen (fig. 3) down to the rim of the swallow hole 12.20 m below datum and to 15.40 m in the swallow hole, affecting Yabrudian (Garrod's E), Acheulean (Garod's F) and Tayacian (Garrod's G) deposits (Ronen & Tsatskin 1995; Ronen *et al.* 2000; Gisis 2008). The Amudian and Mousterian beds were not excavated by Ronen. Unit XIV was excavated by Ronen in squares 31, 32 and 33 between elevations 8.50 and 10.00 m below datum, within the zone previously excavated by Jelinek (fig. 3). Ronen also excavated further west of Jelinek's area, adjacent to the west wall of the cave in squares 45a – d. In squares 45a – d the top part of Unit XIV was excavated, between elevations 7.8 and 9 m below datum (figs. 3 and 9). To avoid confusion with Jelinek's layer numbers, the Yabrudian Layers in Ronen's excavations were numbered from 200 (fig. 7), the Acheulean ones from 300 and the Tayacian, from 400 (Gisis 2008) (tab. 2 and 3).

The most significant markers of the Yabrudian at Tabun are, following Ronen's analyses, a high ratio of Yabrudian scrapers (dejeté and tranversal, types 21-24 in Bordes' list) and a low

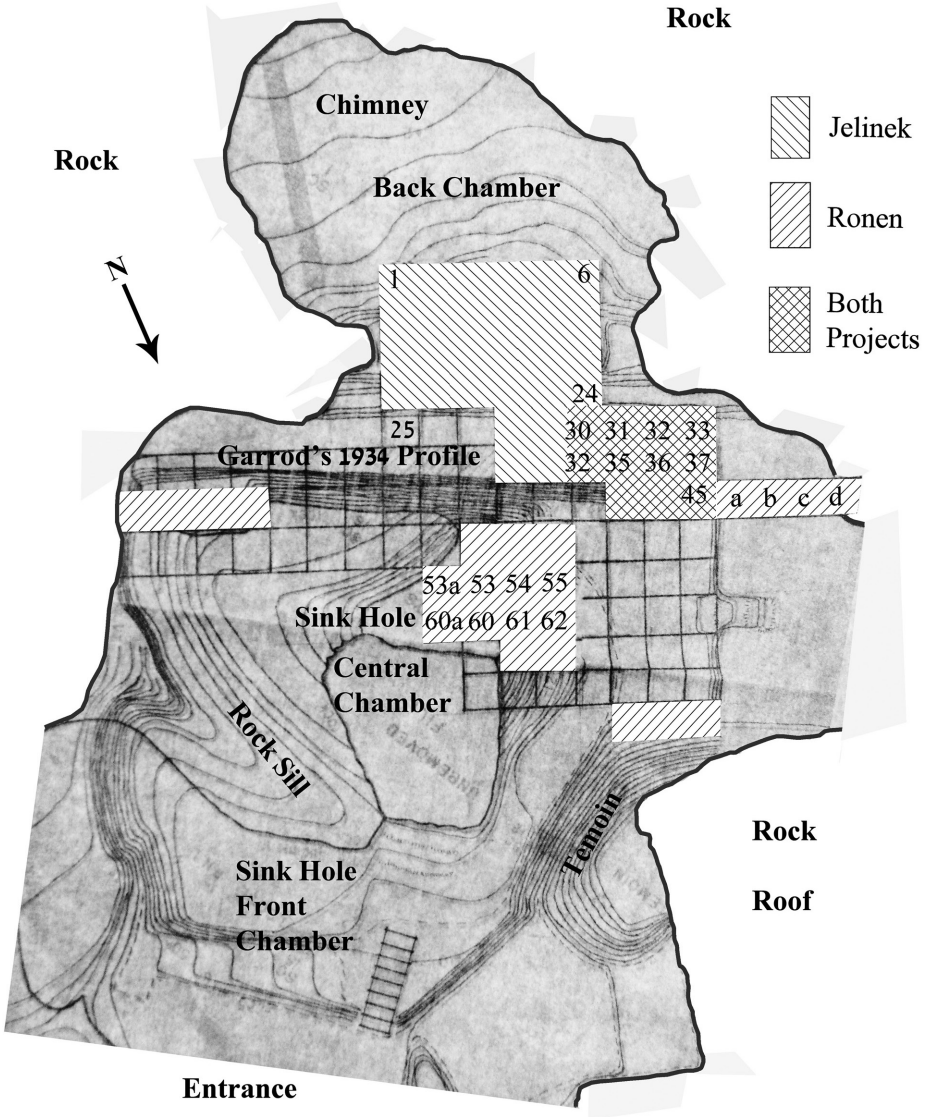

Figure 3 - Tabun plan, squares excavated by Jelinek and by Ronen.

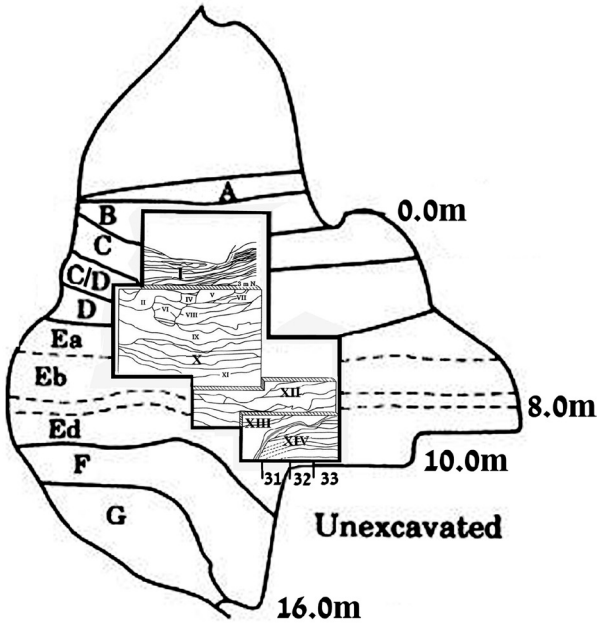

Figure 4 - Composite E-W profile of Jelinek's excavations 1967-1972 within Garrod's main profile (after Jelinek *et al.* 1973).

ratio of handaxes (IBif). The Acheulean at Tabun is inversely characterised by the absence of Yabrudian scrapers and a high handaxe ratio. It is worth noting that both Acheulean and Yabrudian at Tabun are entirely non-Levallois.

We present here the lithics of Unit XIV from Square 33 between elevation 8.50 and 10 m below datum (N=1414) (fig. 6). Due to the sedimentological homogeneity of unit XIV, the bulk was divided in four subdivisions from 33-1 (the uppermost) through 33-4 (fig. 10). Sub-divisions 33-2 and 33-3 are presented in tables 2 and 3. Sub-divisions 33-1 and 33-4 contain, respectively, 41 and 34 modified items, too few to be analyzed. As shown by Tables 2 and 3, subdivisions 33-2 and 33-3 are clearly placed in the Yabrudian, in accordance with Garrod's original interpretation (figs. 11 and 12).

Figure 5 - Unit XIV with unconformity and the SW corner of square 33. Looking west on west profiles of squares 33, 39 and 45.

Figure 6 - Unit XIV. Provenience of lithics analyzed in square 33 between elevation 8:50 and 10 m (N=1414).

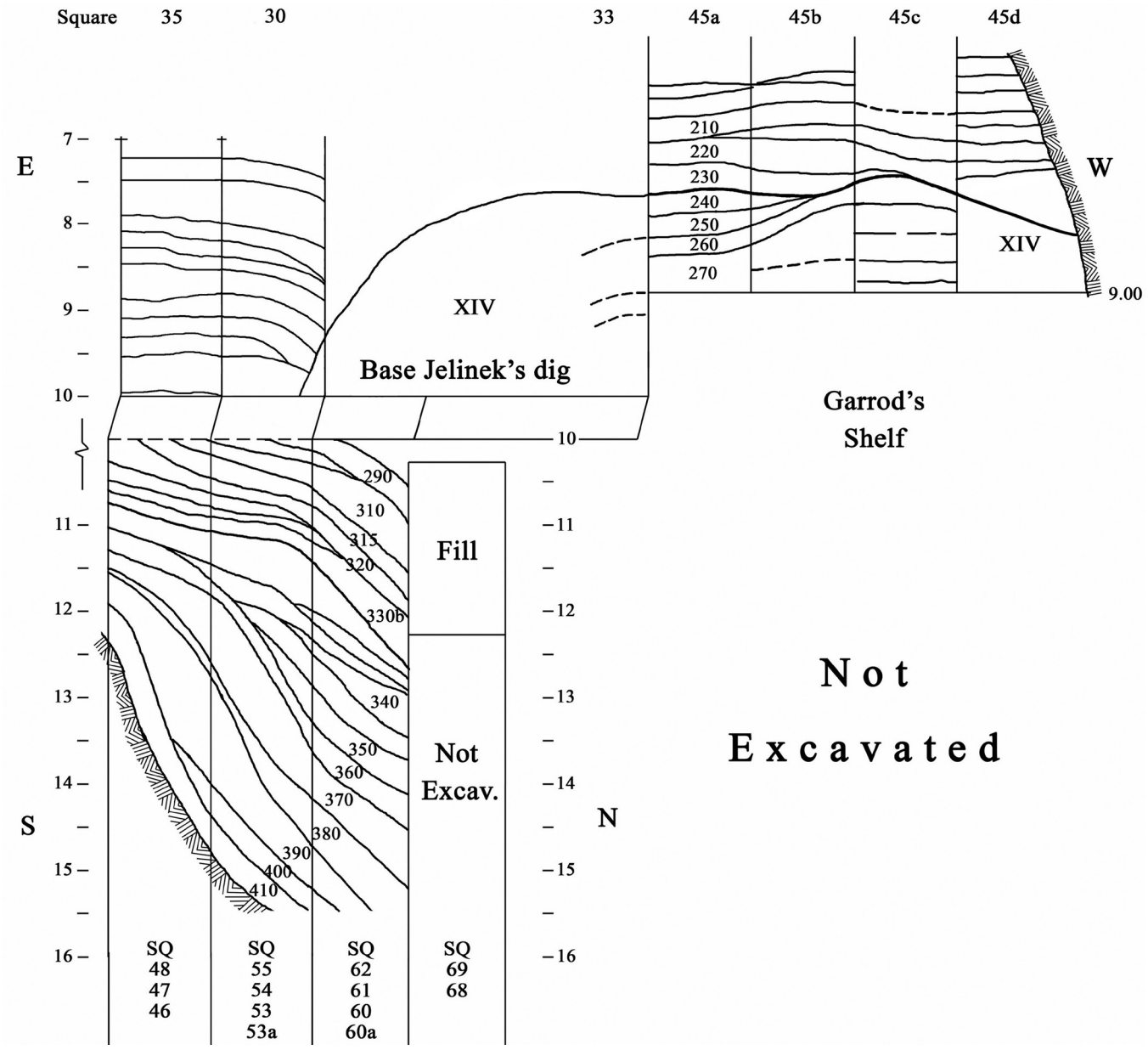

Figure 7 - Synthetic section of Tabun. 400 layers = Tayacian; 300 = Acheulian; 200 = Yabrudian. Note: below 10 m, looking West. Above 10 m, looking South.

Garrod Layer	Jelinek Unit	Mean EU ESR age (ka)	Mean LU ESR age (ka)	Combined ESR and US age (ka)	TL Mean age (ka)	RTL	Sediment
Chimney		-	-	-	-	-	Terra Rosa
B		82 ± 14 (6) 102 ± 17 (1)	92 ± 18 (6) 122 ± 16 (1)	90^{+30}_{-16} (6) 104^{+33}_{-18} (1)	-	-	soil
C	**I**	120 ± 16 (1)	140 ± 21 (1)	135^{+60}_{-30} (1)	165 ± 16 (4)	-	
D	**II**	133 ± 13 (1)	203 ± 26 (1)	143^{+41}_{-28} (1)	196 ± 21 (4)	-	Silt
	V				222 ± 27 (4)	-	
	IX				256 ± 26 (4)	-	
Ea	**X**	176 ± 22 (1)	213 ± 32 (1)	208^{+102}_{-44} (1)	267 ± 22 (4)	-	Sand
	XI				264 ± 28 (4)	-	
Eb	**XII**	180 ± 32 (1)	195 ± 37 (1)	-	324 ± 31 (4)	-	
Ec	-	198 ± 51 (1)	220 ± 63 (1)	-	-	-	
Ec-Ed	**XIII**	262 ± 32 (5)	330 ± 43 (5)	387^{+49}_{-36} (5)	302 ± 27 (4)	-	
F	**XIV**	-	-	-	415 ± 27 (3)	-	
G		-	-	-	-	610 ± 150 (2)	
						630 ± 160 (2)	

Table 1 - Chronology of Tabun layers (Zviely *et al.* 2009).

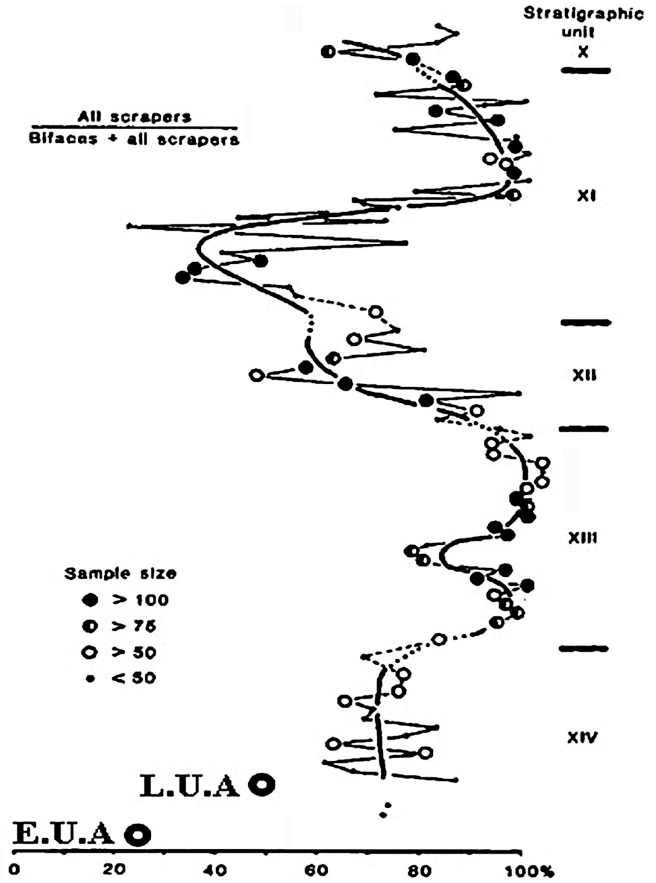

Figure 8 - The fluctuating Mugharan Tradition (Jelinek *et al.* 1973), amended (ULA, ELA = Upper and Lower Upper Acheulian. Gisis 2008).

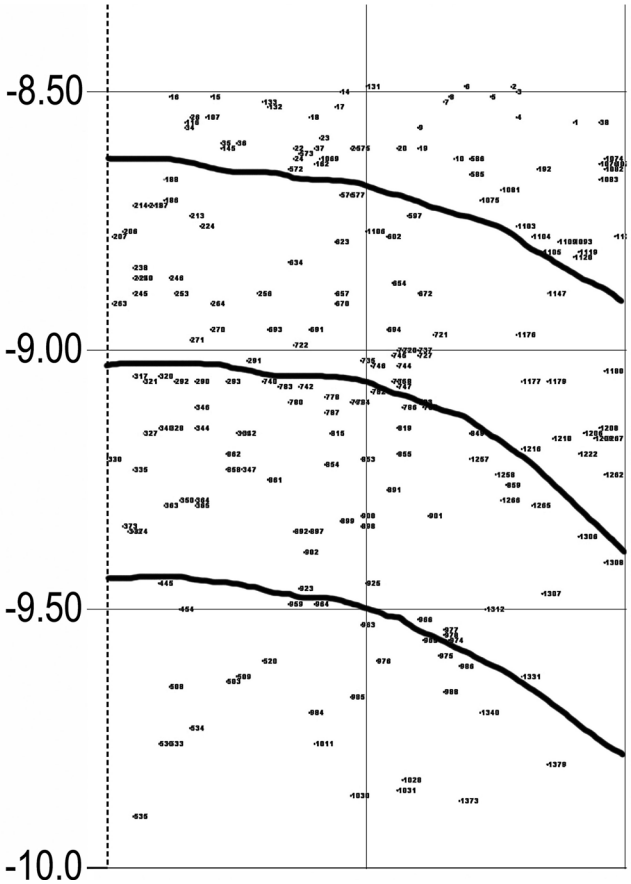

Figure 10 - Schematic subdivision of Unit XIV (a 20-cm thick S-N slice) in square 33 between 8.50 and 10 m below datum (33-1, top).

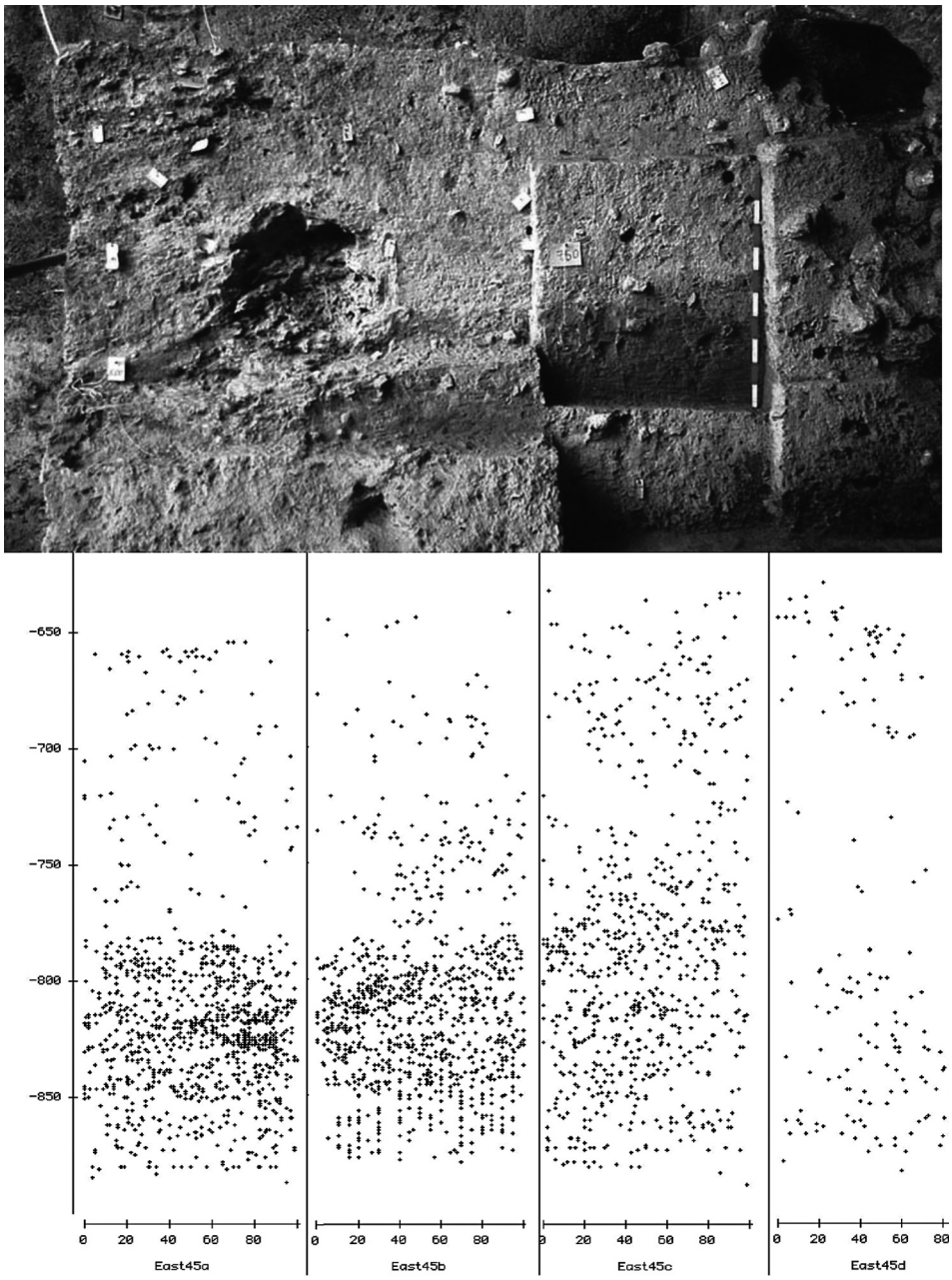

Figure 9 - Squares 45a-d (looking South) and location of finds. Finds above Unit XIV are sparse.

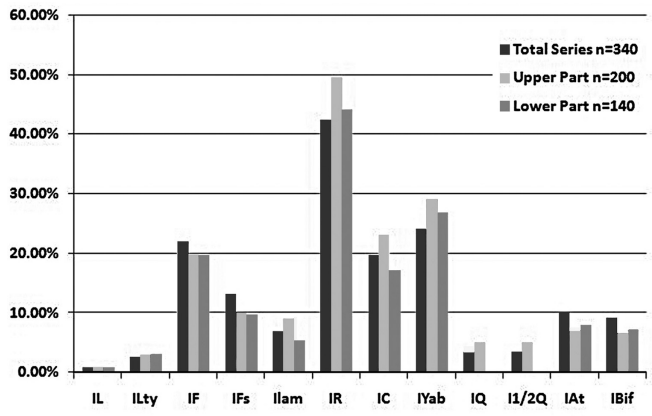

Figure 11 - Major Indices of Unit XIV lithic assemblages from square 33 between elevation 8:50 and 10 m below datum.

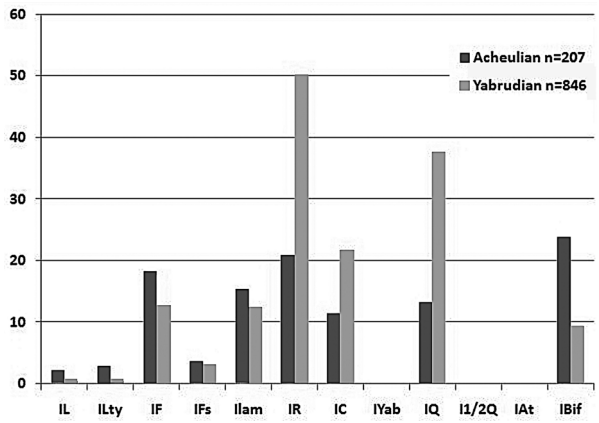

Figure 12 - Major Indices of Acheulian and Yabrudian assemblages at Tabun, Ronen's excavations (Gisis 2008).

	Acheulian		Unit XIV					
Square	**48**		**45a-d**		**33**			
Layer	**320**		**250**		**33-2**		**33-3**	
1 Levallois flake	4	2.8%	1	0.5%	5	2.3%	2	1.3%
2 Atypic Levall. flake	1	2.6%	1	0.5%		0.0%		
3 Levallois point			1	0.5%	1	0.5%		
5 Pseudo Levallois point			2	1.0%				
8 Limace	1	0.7%						
9 Racloir, simple straight	6	4.2%	8	4.0%	9	4.2%	6	4.0%
10 Racloir, s. convex	18	12.5%	39	19.6%	26	12.2%	11	7.4%
11 Racloir, s. concave	1	0.7%	8	4.0%	2	0.9%	1	0.7%
12 Racloir, double straight			1	0.5%				
13 Racloir, d. straight-convex	1	0.7%	2	1.0%	1	0.5%	1	0.7%
14 Racloir, d. straight-concave		0.0%	2	1.0%				
15 Racloir, d. convex	1	0.7%	3	1.5%	2	0.9%		
17 Racloir, d. convex-concave			1	0.5%				
18 Racloir, convergent straight					2	0.9%		
19 Racloir, conv. convex					4	1.9%		
20 Racloir, convergent concave					2	0.9%		
21 Racloir dejetè	1	0.7%	10	5.0%	8	3.8%	2	1.3%
22 Racloir, transverse-straight	1	0.7%			1	0.5%		
23 Racloir, transverse-convex			4	2.0%	9	4.2%	4	2.7%
24 Racloir, transverse-concave			3	1.5%	3	1.4%		
25 Racloir, on ventral face	4	2.8%	5	2.5%	6	2.8%	5	3.4%
27 Racloir, thinned back					1	0.5%		
28 Racloir, alternating retouch	3	2.1%			1	0.5%	6	4.0%
29 Racloir, bifacial retouch					1	0.5%		
30 Grattoir	4	2.8%	3	1.5%	4	1.9%	10	6.7%
31 Atypical grattoir	5	3.5%	7	3.5%	4	1.9%	2	1.3%
32 Burin	9	6.3%	3	1.5%	10	4.7%	12	8.1%
33 Atypical burin	5	3.5%	4	2.0%	4	1.9%	1	0.7%
34 Awl	3	2.1%			2	0.9%	2	1.3%
35 Atypical awl			2	1.0%	3	1.4%	1	0.7%
36 Backed knife					1	0.5%	1	0.7%
37 Atypical backed knife	1	0.7%	1	0.5%				
38 Natural backed knife	35	24.3%	41	20.6%	14	6.6%	12	8.1%
39 Raclette	2	1.4%	2	1.0%	3	1.4%		0.0%
40 Truncation	7	4.9%	2	1.0%	4	1.9%	7	4.7%
42 Notch	7	4.9%	7	3.5%	18	8.5%	8	5.4%
43 Denticulate	3	2.1%	14	7.0%	14	6.6%		
44 Alternate burin-edge	1	0.7%					4	2.7%
45 Retouch on ventral face	1	0.7%					1	0.7%
51 Tayac point					1	0.5%	1	0.7%
54 Notch on end	2	1.4%						
59 Chopper	1	0.7%						
61 Inverse chopper	1	0.7%	3	1.5%			1	0.7%
62 Miscellaneous	1	0.7%	6	3.0%	5	2.3%	6	4.0%
65 Emiroid		0.0%					2	1.3%
66 Disc		0.0%			2	0.9%	4	2.7%
67 Retouched flakes	14	9.7%	13	6.5%	40	18.8%	36	24.2%
Total	**144**		**199**		**213**		**149**	
Handaxes	38		18		12		15	

Table 2 (left) - Type list of Acheulian and Unit XIV assemblages at Tabun, Ronen's excavations.

	Acheulian	Unit X I V		
Square	**48 ***	**45 ***	**33**	
Layer	**320**	**250**	**33-2**	**33-3**
No	**98**	**145**	**159**	**100**
IR	36.73	60	49.06	36
IC	19.38	31.72	24.53	15
Iyab	20.4	38.62	29.56	17
I 21-24	2.04	11.72	13.21	6
GIII	34.69	15.17	20.13	36
GIV	10.2	14.22	20.11	12
IBif	27.94	7.64	7.02	13.04

Table 3 - Restricted Indices (Types 38 and 67 are omitted) of Acheulian and Unit XIV assemblages at Tabun, Ronen's excavations (Gisis 2008).

Conclusions

Jelinek's excavations down to 10 m below Datum have only attained Garrod's Yabrudian layer E without reaching the underlying layers F or G. Hence the proposed "Mugharan Tradition" is only valid within Garrod's Yabrudian (ca 450 - 250 ka BP). Contrary to Jelinek's interpretation, the terms "Mugharan" and "Yabrudian" are synonymous.

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