SYNOPSIS OF THE PALEOLITHIC SOUTHWESTERN ASIA

Period	Sites	Tools/*Hominids*/ Symbolic Behavior	Fauna
Pre-Oldowan >2.0 MYA (Africa)	General: bipolar technique; cores ('choppers'), discoids, flakes used as cutting tools, cores multipurpose for hammerstones, pounding activities; not yet standardized tool forms, absent retouch on flakes *(SS1997, KM1994)*		
	Yiron, northern rift, Israel (K/Ar on overlying basalt) **2.39 MYA** *(RA2006, 1991)*	Flint, few cores, mostly flakes, 2 retouched, (1 scraper, 1 blade fragment) *(RA2006, 1991)*	[radial discoid?, regular retouch in Africa = classic Oldowan; awl and Karari –like core = Developed Oldowan A]?
'Classic' Oldowan ~1.7-2.0 MYA (Africa)	General: hammerstone/anvil bipolar continues adding direct percussion in hand; cores: choppers, polyhedrons, discoids, spheroids and subspheroids. Standardized small tools appear: 'light and heavy-duty' scrapers on flakes or fragments, rare burins and protobifaces; utilized unmodified flakes; rare worked bone *(LM 1971)*		
	Dmanisi , Kura River Basin, Georgia Level V-IV fauna, tools, all hominid remains (fauna and normal mag. Olduvai = 1.77-1.95 MYA (K/Ar on lava underlying) 1.8±0.1 MYA (Ar/Ar on lava underlying) 2.0±0.1 MYA *(BO1994, 1998)* (Ar/Ar) 1.85±0.01 MYA more precise, and fossil and artifacts Unit B Matayama and fauna suggest age slightly <1.77 *(LG2000)* **1.7-1.81 MYA** *(LH2005)* Level III (- mag.) fauna, tools; Level II (- mag.) >90% artifacts	Throughout all levels: 'Pre-Oldowan', core-choppers, primarily unmodified flakes, rare retouched flakes, cores, 1 burin, few worked bones (Dzaparidze et al 1989) absence of small retouched tools hence 'pre-Oldowan' // East Africa 2.55 MYA, Barranco León 1.3 MYA , Fuente Nueva 3 1.2 MYA *(LH2005*) 1 skull, 1 braincase, 1cranium, 775 and 600 cc, *Homo ergaster* (// Koobi Fora) *(GL2000)* closer to *H. rudolfensis* than *ergaster*, ergo *H. georgicus (LM2006, LH2005)* or 'close to stem of *H. erectus' (RG2006)* 'Argues for an early pre-Acheulean migration out-of-Africa and into Asia' *(LG2000)*; variant of *H. erectus (GD2006)*	*Ursus etruscus, Canis sp., Pachycrocuta sp., Homotherium* (scimtar-toothed cat),*Meganetereon whitei* (sabre-toothed cat), *Panthera, Mammuthus meridionalis, Equus stenonis, Dicerorhinus etruscus, Sus sp.,Gazella borbonica, Dama nestii, Cervus sp. Dmanisibos georgicuss, Caprin gen., Ovis sp., Leporinae, gen, Cricetuls, sp. Marmota sp., Sturthio dmanisensis* (Dzaparidze et al 1989) *(BO1994, 1998; GL2000)* Aullan Dispersal Event ca. 1.8 MYA, climatic shift sends African faunas into Eurasia *(BA2006)*

	Erq-el-Ahmar, Israel (paleomag. Olduvai) **1.78-1.96** MYA (Verosub 1989; Ron & Levi 2001) *(PN2002, RH2003)*	Core choppers, flakes // 'Oldowan' (Bar Yosef 1998)	
Developed Oldowan (Africa)	General: pebble core-flake tools ('Mode I') with standardized small tools (variable random to regular retouch), bipolar and single platform cores; reduced % core-choppers, discoids, polyhedrons and heavy-duty scrapers, more refined light-duty scrapers, burins; 1st appearance of awls, edge-trimmed flakes -- *outils écaillé* and few crude bifaces in B and C and punches in C *(LM1971, WJ1982)*		
Developed Oldowan A (Africa)	General: Oldowan tool forms persist, with increase in spheroids and subspheroids and number and variety of light-duty tools; 1st appearance of awls, rare edge trimmed flakes, burins absent, no bifaces yet *(LM1971)* or few burins *(see below)*		
	Ubeidiya, Israel Earliest layers – Li-cycle: K19-20, III-4-20, II-2-20 (faunal and geomag.) **ca. 1.60-1.65 MYA** *(BM2006)* 1.0-1.4 MYA and likely closer to 1.4 MYA (Tchernov 1986, 1987, 1992) *(BO1994, 1998)*	Flint, limestone, basalt; core-choppers, polyhedrons and spheroids but lack bifaces // 'Developed Oldowan' (Stekelis 1969) *(BO1994, 1998)* [Developed Oldowan A, JBH]	Faunal Unit A: *Macaca sylvana, Theropithecus oswaldi, Equus tabeti, Equus sp. (robust), Oryx gazella, Pseudodama sp., Antilopini gen. Indet., Praemegaceros vert., Gazella sp., Pelorovis oldowayensis, Ursus etruscus, Canis mosbach-ensis, Lutra* (river otter)*, Leptobos sp., Kolpochoerus olduvaiensis, Hypolagus Beeremendensis, Crocuta crocuta,, Capreolus sp.,, Bos sp.. Stephanorhinus etruscus, Mammuthus meridionalis (BM2006) Hippopotamus behemoth, antiquus, gorgop;* turtle, catfish *(BO1994)*
Developed Oldowan B 1.0-1.3 MYA (Africa)	General: Similar to Oldowan A, but with few bifaces; 1st appearance of *outils écaillés* and punches, no protobifaces, return of burins; 1st few crude bifaces (pointed handaxe and straight edge cleaver) occur, which are contemporaneous with Early Acheulian and possibly 'borrowed'; increased % worked bone *(LM1971, WJ1982)*		
	Khirbet Maskana, Jordan Valley, Israel	Core-choppers, spheroids, few crude bifaces (AE1963)	[=Developed Oldowan B ? JBH]

Early Acheulian Pluvial	General: high % core choppers, polyhedrons, spheroids, crude handaxe with sinuous edges and large scars, trihedrals and tetrahedrals, a few picks and heavy-duty scrapers, large component of flakes (Hours 1981) *(BO1994)*		
	Ubeidiya, Jordan River Basin, Israel – Fi-cycle: Layers K29-30, I6-32, II21-42, III-21-55 (faunal and geomag.) **1.2-1.6 MYA** *(BM2006)* 1.0-1.4 MYA and likely closer to 1.4 MYA (Tchernov 1986, 1987, 1992) *(BO1994, 1998)* Given their stone reduction techniques, possibly Ubeidiya and Gesher represent 'two separate migration waves out of Africa *(AB1994)*	// Developed Oldowan B or EA *(BO1995);* e.g., I-26a: mostly choppers, scrapers;I-26b2: choppers, amorphous bifaces, polyhedrons, spheroids, scrapers; I-26c: same plus discoids; limestone pebbles primarily for flakes, spheroids, heavy-duty scrapers; flint pebbles for cores, discoids, polyhedrons, bifaces, flake tools; basalt pebbles for core tools, flakes and flake tools, bifaces, including trihedral picks *(AB1994)* Comparable to Olduvai Upper Bed II ~ 1.4 MYA) *(GN2000)* 3 hominid teeth, sp. indet., probably *H. ergaster (BM2002)* 30-70% NISP for all assemblages, *Pseudodama sp*.; other cervids and equids common; gnaw and cutmarks suggest carnivore kill site with low level hominid scavenging of remains *(BM2006)* versus *(GS2004)* hunting	Faunal Unit B1 (lower Fi) and B2 (upper Fi): *Macaca sylvana, Equus tabeti, Equus sp. (robust), Pseudodama sp., Oryx gazella* (B1 only), *Antilopini gen. indet., Praemegaceros vert., Gazella sp., Pelorovis oldowayensis, Ursus etruscus, Canis mosbach-ensis, Lutra* (river otter), *Leptobos sp., Kolpochoerus olduvaiensis, Hypolagus Beeremendensis, Crocuta crocuta,, Capreolus sp.,, Bos sp..Stephanorhinus etruscus, Mammuthus meridionalis + Vulpes sp., Felis chaus, Sus strozzi, Pannonictis pilgrimi, Pantera gombaz., Lynx sp., Herpestes sp., Meganereon sp.*,(B1), *Mellivora sp.,*(B1), *Lycaon lyc.* (B1), *Camelus sp*. (B2) *(BM2006), Hippopotamus behemoth, antiquus, gorgop;* turtle, catfish *(BO1994)*
	Kefar Menachem, Israel (geostratig.) ca. 0.5-0.9 ka (Gilead and Israel 1975, Horowitz 1979) *(BO1994)*	Core-choppers, flakes, retouched flakes: end and side scrapers, burins, notches, denticulates, few crude bifaces on surface, ovates, picks, lanceolates *(BO1994)*	
	Umm Qatafa Cave, Israel Layer G	Core-choppers, flakes -- 'Tayacian' or 'Clactonian' (Neuville 1951, Yizraeli 1967); 'Tabunian' (Howell 1959) *(BO1998)*	

Microlithic Middle Acheulian	General: Middle Acheulian but tools small or 'microlithic'		
Pluvial	Bizat Ruhama, no. Negev, Israel Level C1 (RTL) 740±180 ka; (paleomag. reversed) **.85-.99 MYA** (Laukhin et al 2001) *(ZY2003, RA2006)*	Small flint pebbles, mostly unipolar pebble cores, some bipolar; small tools (ca. 25mm); 40% points, some Tayac points, 29% scrapers, 22% notches and denticulates, rare backed knives, burins, Clactonian notches, no bifaces but two bifacial points (Ronen 1979; Lamdan et al 1977); compare Bilzingsleben, Vértesszölös*(BO1998, ZY2003, RA2006)*	Predominantly *Equus altidans?*; elephant,deer *(BO1998),* hippo (Ronen et al 1998) *(BM2006, RA2006)*
Middle Acheulian Pluvial	General: Inland: core-choppers, polyhedrons, lanceolate bifaces, trihedrals, picks and flakes; some assemblages only core-choppers and flakes // Karari?; coast: more amygdaloid and oval bifaces *(BO1994)*		
	Evron Quarry, Israel Unit 4 (fauna and industry, perhaps similar to Latamne ca. 0.6-1.0 MYA (Tchernov et al 1994) Unit 4: (IRSL, TL on 3 samples taking 9 dates) range 344±25 to 551±101 and (ESR CU teeth) 650±65 ka up to (LU) 687±63 ka and these dates probable underestimation, supports Tchernov 1994 *(PN2002, ZY2003)* and (paleomag.) ~ 3 m below Matuyama boundary so > **780 ka** and likely **900 ka** *(RH2003)*	Unit 1 'Late Acheulian' Unit 4 'early Middle Acheulian', mostly flint, core-choppers, crude bifaces on surface (handaxes), retouched flakes: scrapers, denticulates, notches// Latamne (Ronen 1991) // Ubeidiya *(BO1994, 1995, 1998)*	*Crocuta* or *Hyaena, Stegodon sp., Hippopotamus sp., Cervus elaphus(?), Capreolus sp. Bos primigenius, Alcelaphus sp. , Gazella gazella, Elaphas sp.;* closer to Ubeidiya and Latamne than Gesher *(BO1994)*

	Gesher Benot Ya'aqov, Jordan River, Israel (K/Ar on underlying basalt) 900±150 ka Layers VI-V (Galerian fauna) 700-900K (Stekelis 1960, Goren-Inbar *et al* 1991, 1992) *(BO1994, 1998)* (paleomag. Matuyama boundary) 780 ka, total strata from **~740 ka to ~820 ka** = OIS19, high intensity artifacts ~750-780 ka *(GN2000)* A second wave out-of-Africa after Ubeidiya wave *(GN2000)*	2 femora, *Homo erectus* (Geraads and Tchernov 1983); Layers V-VI: limestone, flint and basalt pebbles used for handaxes, core tools, flakes and flake tools; Levallois for flakes and Kombewa used on basalt for handaxes and cleavers, unique to Near Eastern Acheulian; Layers II-IV: more like other MA sites; II-6: polished wood plank *(BA1994)* All lithic assemblages are Acheulian; radial and Levallois core preparation, all of sufficient size have both handaxes and cleavers and // to Olduvai Bed IV, Masek, Olorgesailie, Isimila, Kalambo Falls, Ternifine, Isenia *(GN2000, GN1994)*; 2 naturally perforated 'bead-like' crinoid fossils natural to site and angular quartz crystals in same deposit *(GN1991)*; 46 pitted cores, blocks, slabs – not bipolar reduction, nutcrackers *(GN2002)*	*Sus scrofa, Stegodon sp, Mammuthus sp,, Elaphas antiquus, Hippototamus amphibius (?), Capra sp., Cervus elaphus, Dama mesopot., Bos sp., Gazella gazella, Dicerorhinus hemiltoechus, Equus sp.*, (= archaic fauna of damp, bush habitat) *(BO1994, GI1994)* Edible seeds, fruits at all 32 layers, e.g., wild grape, water chestnut, water lily, acorn, pistachio, wild olive, plum, jujube (GN2000) and association of edible nuts and pitted hammers and anvils *(GN2002)* Layer II-6 *Palaeoloxodon antiquus* skull associated with core, handaxe, cleaver, flake tools s and 'log lever' *(GN1994*)
	Latamne, Orontes River Terraces, Syria (TL) Latamne Formation 560 ka; entire sequence **500-700 ka** (Copeland 1988, Sanlaville 1988, 1993) *(BO1994, 1998)*	Mostly flint, some limestone and basalt: choppers 4.5%; 36% bifaces; 38% light duty scrapers; 13% heavy duty tools; 5% spheroids, a few trihedral picks; if cores added to chopper-cores, then = 35% and this // Ubeidiya; hard hammer, with a few bifaces soft hammer *(BO1994)*	Equids and elephant types, plus *Gazelle soemm.* and *Dama mesopot.* in archaeological horizon *(BO1998): Canis aureus* (golden jackal., *Cerocuta crocuta, Stegodon trigon., Hippopotamus behemoth, Camelus, Giraffa, Praemegaceros, Dama mesopot., Bos primogenius, Bison priscus, Gazella, Diocrhinus hemitoechus, Equus altidens, Mammuthus trogontheriii (BO1994)*

Middle Acheulian continued	Joub Jannine II, Litani River Basin surface site 'Middle Acheulian' (Besançon et al 1970, Hours 1975, Copeland & Hours 1993) *(BO1994)*	Core-choppers, polyhedrons, high % lanceolate bifaces and trihedral picks , retouched flakes // Ubeidiya more than Latamne *(BO1994, 1998)*	
	Ouadi Aabet and Berzine, Nahr el-Kebir terraces, coastal Lebanon surface site 'Middle Acheulian' *(BO1994)*	Bifaces mostly ovate and amygdaloid, fewer lanceolates and no trihedrals (Copeland & Hours 1979, Hours 1981) *(BO1994)*	
	Saffaqah, Dawadmi, Saudi Arabia (on Red Sea)	Rich MA assemblage, mostly andesite, with bifaces, cleavers, flakes (Whalen et al 1983, 1984) *(BO1994, 1998)*	
	Tabun Cave, Mt. Carmel, Israel – G Unit XIV = Garrod G	Substantial % bifaces, few retouched tools, mostly scrapers; 'Tayacian' (Garrod & Bate 1937) Acheulian *(MN1995)*; no bifaces *(BO1998)* [?]	No fossil bones
	Umm Qatafa Cave, Israel Layer F (Neuville 1951; Yizraeli 1967) *(BO1998)*	'Tayacian' or 'Clactonian' (Neuville 1951, Yizraeli 1967); 'Tabunian' (Howell 1959); no bifaces *(BO1998)*	

Later or 'Upper' Acheulian **500-200 K** Pluvial	General: Mostly bifaces cordiform and amygdaloid outnumber ovate; some ovate dominates; increase use of Levallois technique (though not > 12%), some no Levallois; bifaces more symmetrical and refined; greater use of soft hammer; disappearance of core-choppers; often length of handaxes decreases (Copeland and Hours 1981) *(BO1994, 1998)*		
	Berekhat Ram, Golan Heights, Israel (Ar/Ar above) 233±3 ka (below) 205±162-778±22 ka with integrated age 470±8 ka; artifacts near base of palaeosol between basalt flows *(FG1983)*, but lower flow palaeomag reversed *(PN2002*) [ergo at least 780 ka] (technology – before Yabrudian) **350-500 ka** *(BO1994, 1998)*	Levallois radial technique, Levallois and discoidal cores, small bifaces (amygdaloid, discoid), scrapers, notches, denticulates, burins, awls, points, blades; some Kombewa flakes; no cleavers (FG1983, GN1982, 1985); female figurine, natural shape with artificial grooves *(GN1986,1995; MA1996, 1997, DF2000);* first appearance of Levallois technique in Levant *(BO1994, 1998)*	Lacustrine *(RA2006)*
	Gharmachi Ib, Orontes Valley, Syria (geostrat. Jrabiyat Formation) ~ 300 ka *(BO1994)*	Choppers, 140 bifaces mostly ovoid and amygdaloid, retouched: 25% side scrapers; some Levallois (Muhesan 1985, 1993) *(BO1994, 1998)*	
	Nadaouiyeh I, El Kowm Basin, Syria 200-500 ka *(LJ2004)*	Amygdaloid bifaces, rich flake industry; low frequency of Levallois (Hours et al 1983; Le Tensorer et al 1993); site also contains Yabrudian and Hummelian *(BO1994, 1998)*	Lacustrine setting
	Ain el-Assad (Lion's Spring) and Ain Soda, C-Spring, Azraq Basin, Jordan *(QL2004)*	AA: ovate, amygdaloid, and cordiforms with rich flake industry, Levallois points (Copeland & Hours 1989) *(BO1994, 1998)* AS: 'handaxe assemblages dominated by up to 70 percent tranchet-sharpened bifacial cleavers; also blade cores, 'true blades', points, flakes *(QL2004)*	Lacustrine setting: elephant, steppe rhinoceros, equid, and aurochs *(QL2004)* Why cleavers at Jordanian lacustrine sites but not Holon, Berekhat Ram? A 'cultural' trait? *(RA2006)*

	Tabun Cave, Mt. Carmel, Israel – Layer F (TL 5 flints mean) **320 ka** (Mercier et al 2000) *(MN2003)* (306±33 *VH1998*) ~ 125 ka (FG1983)	'Late Acheulian', rounded bifaces (Garrod & Bate 1937, Mercier et al 2000) *(BO1994; MN1995, MN2003);* resin (palm) hafted bifacial tools *(GA2002)*	
	Jamal Cave, Mt. Carmel, Israel - Unit 3 > 221-224 (see below)	Late Acheulian // Tabun F	
	Umm Qatafa Cave, Israel Layers E and D (Useries speleothem from disturbed location 115±18 ka (Schwarcz 1980) of no value *(PN2002)*	E: amygdaloid-cordiforms = % of lanceolate bifaces D:% and size decreases (Neuville 1931, 1951, Gilead 1979) *(BO1994)*	
	Holon, Israel (ESR) **204±16 ka** (OSL on 2 burnt flint) 198±22 ka and 201±17 ka *(PN1999)* ave. 200±20 *(PN2002)* but must be much older than Tabun E TL dating *(BO1998)* or LA overlaps MP *(CM2000)*; (recalculated ESR CU) 196±17 and 219±22 ka = ave. 208±20 *(PN2002)*	Chert cores, choppers, retouched flakes: side scrapers, denticulates, notches; bifaces (no cleavers), mostly pointed and rounded (Noy 1967, Nir & Bar-Yosef 1976) 'Middle Acheulian //Umm Qatafa E' *(BO1994)*; flaking neither Levallois nor discoidal, but trifacial *(CM2000)*; cutmarks on bones *(CM2002)*	Lacustrine, predominantly *Dama mesopotamica* (fallow deer); *Bos primiginius, Elaphus antiquus* (Chazan 2000) *(PN2002)* also hippo, equid, turtle *(BO1994, RA2006)* Why no cleavers at sites such as Berekhat Ram and Holon? A 'cultural' trait? *(RA2006)*
	Revadim Quarry, Soreq River, south coastal, Israel (geostratig. OIS8 **245-300 ka** *(GG1999)* (TL IRSL) brackets artifacts 194±8 ka to 403±27 ka (Marder et al 1999) *(GG1999, PN2002)*	Middle-Late Acheulian, discoidal and Levallois cores, choppers, handaxes, scrapers by Levallois technique; high % flake tools dominated by notches, denticulates, awls, low% sidescrapers // Holon 15 km away *(GG1999)*	*Palaeoloxodon antiquus*, equid, wild boar, roe and red deer, gazelle, wildcat, rodent; climate moist, grassland, scattered trees, small lake (*GG1999*, Marder)
	Mchairfet es-Samouk, Nahr el-Kebir, Syria	Many cores, small core-choppers, small bifaces; occasional dominance of rounded bifaces; 40% of cores Levallois (Muhesan 1985) *(BO1998)*	Special facies: LA with core-choppers

	Tel Hesi, Israel	Many core-choppers; bifaces of 'Upper Acheulian' (Gilead not yet published) *(BO1998)*	Equid bones *(BO1998)*
	Ma'ayan Barukh, Golan Heights, Israel (U-Series) > 350 ka (FG1983)	Southern Levant, Ma'ayan Barukh (MB) group: amygdaloid, cordiform and subtriangular 40-50%; ovate 20-25%; few pointed and some cleavers (Gilead 1970, Bar-Yosef 1977) // Umm Qatafa D2 *(BO1994, 1998)*	
	Evron and Kissufim, Israel (stratig.) later than M-B group (Gilead 1970, Bar-Yosef 1977) *(BO1994)*	Southern Levant, Evron-Kissufim (EK) group: richer flake tool component up to 30-60%, clear use of Levallois; bifaces show decrease in ovates and discoids and slight increase in pointed forms (Gilead 1970, Bar-Yosef 1977) *(BO1994, 1998)*	
	Sahel el Khoussin and Yiron and Rephaim Baqa'a and Beith Uziel, Israel (Gilead 1970, Bar-Yosef 1977) *(BO1994, 1998)*	Southern Levant, Sahel el Khoussin and Yiron (SY) group: cruder bifaces, sometimes dominated by rounded forms over cordiform forms (Gilead 1970, Bar-Yosef 1977) *(BO1994, 1998)*	
	Kudaro I, Transcaucasia Layer 5 (TL) 350±70 or 360±90 ka Level 6 (paleomag. reversal) suggests older dating for L 5 (Liubin & Bosinski 1995) *(BO1998)*	Core-choppers, bifaces, elongated handaxes, flake cleavers; high % retouch, including side scrapers; teeth, *human* (Liubin & Bosinski 1995) *(BO1998)*	
	Kudaro III, Transcaucasia Layers 6-8 L 5 (TL) 252±51 ka and 245±49 ka L 8a (TL) 560±112 ka (Liubin & Bosinski 1995) *(BO1998)*	Bifaces and flake tools (Liubin & Bosinski 1995) *(BO1998)*	Layers 7-8 dominated by bear remans (*Ursus deningeri, Spelaeus deningeri*) (Liubin & Bosinski 1995) *(BO1998)*

Mugharan Tradition 'Acheulo-Yabrudian' 400-150K ***(GA2005)*** Interpluvial	General: Three facies of the Mugharan Tradition *(JA1982),* ("Final Acheulian")		
	Tabun Cave, Mt. Carmel, Israel, Layer E Tabun XIII=Garrod Ed XI (beds 81-85) (TL mean of 4 burnt flints) **302±27 ka** (280-357 ka) (was 331±30) [(ESR tooth in situ EU 262±32, LU 330±43, CU **387+49/-36** and matches Eb-Ed mean TL 340±33 ka *(RW2004)*] Tabun XII=Garrod Ec+Eb XI (beds 78-80) (TL mean of 4 burnt flints) **324±31 ka** (301-361 ka) (was 350±33) Tabun XI= Garrod Eb+Ea XI (beds 73-77) (TL mean of 10 burnt flints) **264±28 ka** (191-351 ka) (was 306±13) Tabun X= Garrod Ea+D X (beds 70-72) (TL mean of 2 burnt flints) **267±22 ka** (251-282 ka) (was 270±22) *(MN2003, 1995,1994, BO199, VH1998)*; Ea: (Useries EU) 158-167 (LU) 158-196 *(MF1993)*	femur, *archaic Homo sapiens* (McCown & Keith 1939) *(BO1994)* XIII: Yabrudian (with Acheulian layer intercalated) XII: Acheulian (extends into early XI) XI: Acheulo-Yabrudian with 'intercalated Amudian blade industry; Acheulian at end of XI and extends into early X) X: 'transitional to MP, increasing Levallois'' (Garrod & Bate 1937) or 'Acheulian-Mousterian Transition' with fairly high % bifaces (Jelinek) *(JA1982, BO1994, MN1995)*;	Tabun Ec, Ed: hippo; steppe rhino; elephant; ox; horse; wild ass; fallow deer; gazelle; goat, pig, crocodile *(WJ1982)* Note. These ESR dates from museum teeth not in situ *(RW2004):* Ed: (ESR on teeth EU) 149±17 ka (LU) 191±28 ka Eb: (ESR on teeth EU) 180±32 ka (LU) 195±37 ka Ea: (ESR on teeth EU) 176±22 ka (LU) 213±32 ka and (Combined US/ESR) 208+102/-44 ka *(GR2000)* are younger but if favor LU not by that much *(MN2003)*

Yabrudian facies	High % sidescrapers and points often on thick flakes, high % Quina and demi-Quina retouch, few UP tools and rare blades; no clear Levallois; few or no bifaces (Copeland & Hours 1983, Jelinek 1982) *(BO1994, 1989)* bifaces rare (MN1995)		
	Jamal Cave, Mt. Carmel, Israel Unit 2 (Useries on speleothem capping unit, uncorrected) > 227+35/-26 ka (corrected) **221-224 ka** *(WM1999)*	Unit 3: Acheulian // Tabun F Unit 2 Acheulo-Yabrudian // Tabun E Unit 1 Mousterian // Tabun BCD *(WM1999)*	
	Yabrud Shelter I, Syria Levels14, 22, 25 *(AT2005)* and also 16, 20, 21*(RA1950)* Note Level 18/19 dated **226 ka** (see A-Y below)	Yabrudian *(RA1950, AT2005)*	
	Aïn Hummal, El Kowm Basin, Syria Hummal Well Level 1b (TL on 3 burnt flints) **160±22 ka** *(MN1994)* Hummal 2 (Useries) 156±16 ka (Henning & Hours 1982) *(BO1989)*	Yabrudian *(BO1994, 1989)*	
	Umm El Tlel, El Kowm Basin, Syria (Useries) Umm V 245±16 ka Umm III **139±16 ka** Umm IV (with mixed MP) 76±16 ka (Henning & Hours 1982) *(BO1989)*	Yabrudian *(BO1994, 1989)* or Umm V, 'Pre-Yabrudian' *(TI2000)*	
	Abri Zumoffen (Garrod & Kirkbride 1961) *(AT2005)*	Yabrudian *(AT2005)*	

'Acheulo-Yabrudian facies'	Heavy duty sidescrapers fashioned as in Yabrudian, with steep or scalar retouch; with 15% bifaces, prismatic blades, backed knives; points; Levallois absent (Jelinek 1982) *(BO1994,1989, MN1995)*		
	Zuttiyeh Cave, Israel (Useries) 1a: **164±21 ka** 4: 148±6 ka 6: 97±13 ka 1: 95±10 ka (Schwarz et al 1980) (tools) but probably twice 164 ka (Bar-Yosef 1998) *(JH2005)* [thus ca. 300 ka]	1a, 4: Acheulo-Yabrudian; 1, 6: Inter-Yabrudian-MP *(TI2000);* skull fragment (Gisis & Bar-Yosef 1974) *archaic Homo sapiens*, not *H*. neanderthalis (Vandermeersch 1989); compared to Zhoukoudian as global archaic *(SS1993)*	
	Yabrud Shelter I, Syria 11, 18, 19, 24 *(RA1950)* Layer 18/19: (ESR teeth average) (EU) 222±17 ka (CU) **226±15** (LU) 256±14 *(PN2002);* (TL on 6 burnt flints at ~ 4.5 m) 195±15 ka; recalculated as **224±17** *(MN1994, PN2002)*	Acheulo-Yabrudian and Micoquian *(RA1950)*; 19: handaxes and flake tools including Nahr Ibrahim truncations // Holon; 18: also handaxes and flake tools; view 18/19 as Upper Acheulian/A-Y boundary at OIS7 *(PN2002)*	Equids (most common at Yabrud I) *(RA1950)* and only faunal remains available for ESR *Equus sp.* and *Equus hemionus* (PN2002)
	Umm Qatafa Cave, Israel Level D D2: (ESR 3 teeth average) (EU) 262±51 ka (CU) 313±69 ka (LU) 409±86 a wide scatter, only 1 tooth low scatter (EU) 187±17, **(CU) 213±26,** (LU) 268±17 ka *(PN2002)*	D: cordiforms < % than lanceolate bifaces and size decreases from Level E. D2 = Upper Acheulian, ovate, discoidal and cordiform bifaces, increased % burins; D1 = Micoquian (Neuville 1931, 1951, Gilead 1979) *(BO1994, PN2002)*	Most common, *E. maurti-tanicus, Capra ibex, Gazella sp., Cervus elaphus*, plus carnivores, rodents, rats (Vaufrey 1951) *(PN2002)*
	Tabun XI= Garrod Eb+Ea TL dated to **264**±28 ka (see above)	XI: Acheulo-Yabrudian with intercalated Amudian blade industry Garrod & Bate 1937; Jelinek 1982) *(BO1994, MN1995)*	

Amudian	Rich in blades, end scrapers and burins; backed knives and rare bifaces, limited Levallois technique, typologically closer to Acheulian facies than Yabrudian; originally called 'Pre-Aurignacian' (Jelinek 1982) *(BO1994, 1989)*		
	Qesem Cave, Israel Upper Levels (Th/U TIMS on speleothem fragments in archaeological breccia) range from capping at 151.97+7.55/-7.02 to 381.98+36.73/-26.65 ka = OIS 11 with lower parts still undated, suggesting occupation between **~ 200 and 382 ka** and suggesting a Late A/A-Y boundary at ~ 400 ka *(BR2003, GA2005)*	Earliest levels: Acheulian with chopping tools and spheroids Upper levels: 'Yabrudian' thick scrapers throughout, backed knives, side scrapers, few handaxes at bottom and top but not in every assemblage *(BR2003)* reclassified as Amudian because of % of blades, endscrapers, burins, backed knives *(GA2005)*; use-wear bone, hide, flesh cutting using blades to cut, deflesh soft tissue, burned bones, marrow extraction *(GA2005, SM2004)* and plant collecting *(LC2006)*	Hominid diet narrowly focused on *Dama (*fallow deer) >80% total NISP, along with some aurochs (*Bos*), horse (*Equus*, caballine type), wild boar (*Sus*), tortoise (*Testudo*), and rarely red deer (*Cervus*); faunas are distinctly Holarctic throughout, with no Afro-Arabian types, in marked contrast to early Mousterian faunas from the region such as Hayonim Cave *(SM2004)*
	Tabun Cave, Mt. Carmel, Israel, Layer E Tabun XI= Garrod Eb+Ea (TL) **264±28 ka** (see above)	Amudian blade industry intercalated in Ea amidst Acheulo-Yabrudian (Garrod & Bate 1937; Jelinek 1982) *(BO1994, MN1995)*	
	Abri Zumoffen, Adlun Lebanon	Dominated by backed blades or knives; end scrapers; burins; small triangular unifacial points; rare small bifaces; pebble chopper cores *(WJ1982)*	
	Amud Cave, Israel - B	Amudian (WJ1982)	
	Yabrud Shelter I, Syria Layers 13, 15 *(RA1950)*	'Pre-Aurignacian' *(RA1950)*	
	Zuttiyeh Cave, Israel	Amudian assemblage *(GA2005)*	

Middle Paleolithic **OIS 7 (247-183 ka)** *(PN2002)*			
Levantine Mousterian 225-300 ka (RW2003)	General: dominated by Levallois triangular flake blanks (rare in Mugharan Tradition); minimal preparation of the block, platform often left cortical; divided into Tabun D, C and B (Copeland 1975) *(BO1992)*		
<u>Tabun D</u> (wetter conditions, 90 – 65 ka) *(CG1989)* No hominids yet reported (BO1995)	Tabun D = (flake) blanks, elongated blades and points removed from unipolar convergent cores and bipolar cores with minimal preparation of striking platform; some Levallois; retouched points—many elongated, prismatic blades, endscrapers and burins common *(BO1995; CG1989; JA1982)* // Typical Mousterian + blades		
	Tabun Cave, Mt. Carmel, Israel – Unit IX = Garrod Layer D IX (beds 62-69) (TL mean of 3 burnt flints) **256±26** ka (249-297 ka) (was 263±27) *(MN2003, 1995,1994, VH1998)* (US/ESR) 143+41/-28 ka, (ESR LU) **203±26** ka (EU) 133±13 ka *(GR2000)*	Dominated by laminar and elongated triangular blanks, mostly by unidirectional method; 'Lower Levalloiso-Mousterian' (Garrod & Bate 1937) and rare bifaces (*JA1982*) *(BO1994; MN1995)* (EU) 93, (LU) 152 ka *(MF1993)*	Tabun C, D (Mt. Carmel): hippo; steppe rhino; ox; horse; wild ass; roe, red, fallow deer; small bear; gazelle; hartebeest; goat, pig, warthog, leopard; hyena; jackal; fox; polecat; hedgehog; hyrax; porcupine; crocodile; *(WJ1982)* [not elephant]
	Rosh Ein Mor (D15), Negev, Israel (U-series on eggshell) **200+9.5/-8.7 ka** *(RW2003)* and (D35)	59% unretouched non-Levallois flakes, some blades; 12% Levallois blanks, blades, points; 8% retouched tools *(MA1976);* // Tabun D (Munday 1979) *(BO1995)*	Mediterranean mixed forest and grassy plains, more fluvial; *Equuus hemionus*, ostrich; ostrich eggshell *(MA1976)*
	Hayonim Cave, Israel Level F: (ESR) **~ 215 ka** (Meignen et al 2001) *(PN2002)*	Level F, Tabun D with blades, superimposed on earlier Acheulo-Yabrudian (Meignen et al 2001) *(PN2002)*	Hunted gazelle and deer (Mary Steiner)
	Hayonim Cave, Israel Lower E (TL 5 flints) **~200 ka** *(VH1998)* Lower E: (ESR) 196±34 (EU), 200±32 (LU) (Lower E Front) (ESR) (EU) 241±11, (LU) 257±6 ka *(SHR1998, PN2002)*	Lower E: Tabun D, hearths; several flints retained red ochre on retouched edge *(BO1995, 1997);*	
	Zuttiyeh Cave, Israel (TL 5 flints) 3 had mean age 106±7 ka, 2 mean age **157±13 ka** *(VH1998)*	Mousterian (Gisis & Bar-Yosef 1974), not B, C or D *(TI2000)*	

Tabun D continued			
	Wadi Hasan 634, Ain Difla, central Jordan (E of cent. Negev) (Useries upper tuff) 141±20 ka *(TI2000)* middle level (ESR EU) 102.9±12.9(LU) 162±18.2 (TL level 5) **105±15 ka** (Bar-Yosef 1998, Henry 1998) *(TI2000)*	Tabun D industry (Clark et al 1985) *(TI2000)*	Dominated by *Equus hemionus/asinus*, *Equus sp.*, and also gazelle, wild goat *(TI2000)*
	Nahal Aqev (D35), Negev, Israel (Useries) Layer B 211±19 ka; Layer D 74±5 ka and 85.2±10 (Schwarcz et al 1979) *(BO1989)*	Tabun D industry *(BO1995)* Layer B 'pre-Mousterian' Layer C: Tabun D Layer D 'below Mousterian' *(BO1989)*	Negev 40-70 ka (Würm 1) period, Mediterranean climate, oak, olive, pistachio, pine maquis; higher watertable, more active springs; savannah fauna, esp. *Equus hemionis (MA1976)*
	Boker Tachtit, Negev, Israel Level 1: **80±10 ka** [?] (Marks 1981) *(MA1983)*	Tabun D industry by type and technology *(MA1983)*	

	Yabrud I, Syria Layers 8-10 *(RA1950)*	Tabun D *(TI2000)*	
	Aïn Hummal, El Kowm Basin, Syria Hummal Well 6b (TL on 3 burnt flints Level 6b) **104±9 ka** *(MN1994)*	MP 'Hummalian', blades and points common like Tabun D, but not by Levallois (Copeland & Hours 1983) *(BO1995)*	
	Umm el Tlel, El Kowm, Syria Umm IV (with mixed MP) (Useries) **76±16 ka** (Henning & Hours 1982) *(BO1989)*	57 MP levels *(BE1999)*; Tabun D industry *(BO1992)* interlayered with Yabrudian *(TI2000)*	
	Jerf Ajla Cave, Syria Lower Layers (14C) 42±2 ka (Weinstein 1984) *(BO1989)*	Tabun D industry *(BO1992)*	
	Douara Cave, Syria, IV - Layers C, D, E *(BO1992; AT2005)*	Tabun D; hearths *(BO1992, AT2005)*	*Celtis* fruit gathering (Akazawa 1987) *(BO1995)*
	Abu Sif; Sahba, Israel	Tabun D industry *(BO1995)*	
	Bezez Cave, Layer B (Copeland 1983)*(BO1992)* 100 ka *(TI2000)*	Tabun B industry *(BO1992)* or D (TI2000)	

Tabun C ca. 90 ka to 120 ka *(BO1992)*	Tabun C = blanks, often ovoid and large flakes, struck from Levallois cores, with radial or bipolar preparation; triangular points in small numbers *(BO1995);* classic flake side scrapers *(GC1989)* // Europe: La Ferrassie Charentian Mousterian		
	Tabun Cave, Mt. Carmel, Israel - Units I to upper V = Garrod Layer C Unit V (beds 41-42) (TL mean of 4 burnt flints) **222±27 ka** (188-266 ka) (or 244±28) Unit II (beds 27-32) (TL mean of 3 burnt flints) **196±21 ka** (183-215 ka) (was 212±22) (ESR on teeth EU) 133±13 ka (LU) 203±26 ka *(GR2000)* Unit I (beds 17-26) (TL mean of 7 burnt flints) **165±16 ka** (128-195 ka) maybe two strata at ca. 178 ka and 134 ka (was 171±17) *MN2003, 1994, 1995, VH1998)* (ESR on teeth EU) 120±16 ka (LU) 140±21 (Useries/ESR) 135+60/-30 *(GR2000)* (EU) 111-121; (LU) 113-134 ka *(MF1993)*	Dominated by broad oval Levallois flakes, often radially prepared core; virtual absence of triangular points; 'Lower Levalloiso-Mousterian' (Garrod & Bate 1937; *JA1982*) *(BO1992, 1994; MN1995;* Only T2 mandible securely placed in Layer C; T2 robust *H. sapiens sapiens* (Vandermeersch 1981) *(MN1995)*	Tabun C, D (Mt. Carmel): hippo; steppe rhino; ox; horse; wild ass; deer, roe, red, fallow; small bear; gazelle; hartebeest; goat, pig, warthog, leopard; hyena; jackal; fox; polecat; hedgehog; hyrax; porcupine; crocodile; *(WJ1982)* [not elephant]
	Hayonim Cave, Israel Upper E (TL 7 flints) **~150 ka** *(VH1998)* (ESR) 164±15 ka (EU) and 171±17 (LU) *(SHR1998, PN2002)* Upper E (Useries) 163±3 *(TI2000)*	Upper E: Tabun C industry (Meignen, 1998)	

	Skhul, Israel – Layer B (TL on 6 burnt flints)(B2) **119±18 ka** *(MN1994, MN1995, VH1998)* (ESR and TIMS Useries) (molar S2) (bone fragment S9 and bovid tooth at S9) (boar mandible in S5) **all between 100 and 130 ka or S9 ~ 140 ka and S2 and S5 98+19/-10 ka** *(GR2005)* (ESR Useries on less well provenanced teeth) ~55-100 ka (Stringer et al 1989) (EU) 46-88 ka (LU) 66-102 ka *(MF1993)*	Tabun C industry *(BO1992);* 10 MNI, 5 adult males, 2 adult females, 3 children in 'shallow graves' (Day 1977) *(WJ1982) several burials, 1 female 'deliberate burial' (BO 1993)* or *based on articulation*, 4 burials (McCown 1937)*(BA1992) Homo sapiens sapiens with some archaic features*; S5 burial with wild boar mandible; marine shells not related to food acquisition *(BO1995)*, 2 shells are beads *(VM2006)*	
	Qafzeh, Israel Layers XVII-XXIV (fauna palaeoclimate) ~ 80-100 ka *(BO1993)* XVII-XIX and XXI-XXIII: (TL on 20 flints) range **85-102 ka**; isochron **92±5 ka** 'implies with Tabun I 171 ka long period of Tabun C industry' *(MN1994, MN1995, VH1998)* XIX: (ESR Useries on teeth EU) 100±10 ka (LU) 120±8 ka (Schwarcz et al 1988; Grün & Stringer 1991) and (gamma) 80-94 ka (Yokoyama et al 1997) *(GR2005)*; (EU) 103-105 (LU) 115-125 ka *(MF1993)*	Tabun C industry (Boutie 1989) *(BO1992);* hearths *(BO1995)* 18 MNI *(GR1999) Homo sapiens sapiens;* min. *3 burials, 1 adult flexed on right side in natural niche in limestone wall; Q9 adult female and Q10 6-yr old together in 'pit',' a double burial'; Q11 boy 13-yrs. in cavity cut into soft bedrock with* large fallow deer antler over hands over upper chest, not hyena gnawed hence burial *(BO1993);* or 7 burials *(BA1992)*; but *(GR1999)* no burials, rock fall;*);* ochre; red ochre on working edges of some tools, 4 perforated *Glycymeris* marine shells not related to food acquisition *(BO1993, 1995)* but natural *(VM2006); t*emporally cluster with burials *(HE2003)*	Use-wear indicates 37% woodworking, 17% bone-working, 12% butchery, hafting, vegetal, skin-working, remarkably similar to Kebara (see below) *(SJ1989)* Layer XVII, in square B16, Qafzeh 8 burial, and, 1/3rd m. away, broken Levallois core (recurrent centripetal flaking), triangular flat surface, 'plaquette', incised with mostly parallel stroke marks truncated by accidental break or intentional snap; grinding between two sets of lines *(HE1997)*; fragment in B16 with scrape marks on both faces(Vandermeersch 1969); min. 84 ochre pieces at every level, 6 worked, specific hues selected and manuported 40 km, % associated with burial loci and levels *(HE2003)*

	Naamé, coastal Lebanon Level Strombus (mollusk) Enfean II = 90-105 ka (Sanlaville 1981) (Useries) **90±20** and 93±5 Level Vermet 90±10 ka *(TI2000)*	Tabun C (Bar-Yosef 1998) *(TI2000)*	
	Nahr Ibrahim (Asfurieh) Cave, Lebanon *(SRW1975)* (geostratig.) 80-92 ka (Farrand 1994) *(TI2000)*	Tabun C and B (Copeland 1981) *(TI2000)* Layer III: partial skeleton of fallow deer (*Dama m*.) 'burial' with red ochre; bones gathered in pile, some still articulated, unbroken, and skull cap placed on top, in association with flints, unusually large number just above the skeleton, pieces of red ochre (not local) scattered in it; near *Helix* shell, hearth and bovid bones and a rhino tooth (maybe intrusive) *(SR1982, MA1990)*	*Dama mesopotamica, bovid, rhinoceros; Helix* Note: red ochre in only 3 Mousterian sites, Nahr Ibrahim, Qafzeh, Geula (Wreschner 1980, 1982) *(GI1999)*
	Ras el Kelb, Lebanon (geostratig.) over Enfean II [= < 90-105 ka] and > 52 ka *(TI2000)*	Tabun C (Copeland 1981) *(TI2000)*	
	Yabrud I, Syria Layers 6-7 *(RA1950)*	Tabun C *(TI2000)*	

Mousterian of Acheulian Tradition	General: an early Mousterian with both Levallois reduction and bifacial reduction from cores for foliates and handaxes *(BA2006)*		
	Har Karkom, central Negev, Israel HK190a, 190b and several other sites *(AE2006)*	HK190a: 'Mousterian of Acheulian Tradition bifacial implements and Levallois flints' *(AE2006)*; [Rhomboid with engraved circle 'navel' figurine, 2 other possible 'female' figurines, fluid-shaped 'pick'; triangular nuclei with 'vulva' and possible zoomorphs *JBH*]	
	Wadi Arah, Bir Khasfa, southern Oman n.d. *(RJI2004b)*	MAT, combination of *façonnage* and centripetal core reduction; toolkit dominated by small bifacial foliate points, also ovate bifaces, and sidescrapers, few blades; foliates worked by invasive soft hammer retouch; not SW Asian industry, hence via NE Africa *(RJI2004b)*	Suggests East Africa through Bab al Mandab into Arabia during OIS5 interglacial *(RJI2004)* or via Nubian Mousterian *(BA2006)* Oman sites flanking Rub' al Khali, non-prepared core, but *façonnage* common, small bifacial foliates *(RJI2004b)*

Aterian MP (North and Northeast Africa Aterian dated **OIS5 65-128 ka** or earlier)	Flake-based industry, Levallois, discoid and other prepared cores; tanged, pedunculated flakes worked into points; bifacial foliated 'leaf' points from core reduction;; flake-blades with faceted striking platforms, flake tools (scrapers; burins; knives, awls, denticulates), rare small handaxe *(WJ1982; BA2006)*		
	Bani Khatmah, Rub' al-Khali, Saudi Arabia	Aterian, tanged points, scrapers, small bifacial foliates, knives, awls, denticulates (McClure 1994) *(PM2004; BA2006)*	Well-watered, grassland environment (McClure 1994) *(PM2004)*
	Har Karkom, Negev, Israel – HK148b *(AE2006)*	Aterian notched points and late Middle Paleolithic flints; hut floor *(AE2006)* [zoomorphic, anthropomorphic and geometric figurines -*JBH*]	

Tabun B ca. 46-48 to 80-90 ka *(BO1992)* (cooler, dryer conditions 65-45 ka) *(CG1989)*	Tabun B = return to triangular blanks, removed from mainly unipolar convergent Levallois cores, broad-based Levallois points; short thin flakes and some blades; also radially prepared cores in upper contexts of Tabun B *(BO1995);*		
	Tabun Cave, Mt. Carmel, Israel – Layer B Unit I (beds 1-16) (Combined Useries/ESR) **104+33/-14 ka** *(GR2000)* (Useries EU) 76, (LU) 85 ka *(MF1993)* (U-series EU, TC1 mandible) 34±5 ka (femur) 19±2 ka (EU) or 33±4 ka (LU) *(SH1998)* but (ESR EU) **112±29 ka** (LU) 143±37 ka *(GR2000)*	'Upper Levalloiso-Mousterian' (Garrod & Bate 1937; *JA1982*) *(BO1994; MN1995);* triangular Levallois blanks, including short, broad-based Levallois points from cores with unidirectional or radial preparation , narrow laminar, thin flakes (Copeland 1975)*(BO1992)*	TC1 female skeleton may be Layer B (Garrod & Bate 1937, Jelinek 1982) *(BO1995)* and U-series dating indicates Layer B *(SH1998)*; TC1 cranium small 1,300 ml, *Homo neanderthalis (TI1988*); 7 teeth of TBC7 assigned to Layer B (EU) 92±18 ka (LU) 82±11 ka (CU) **90+30/-16 ka**; probable *Neanderthal (CA2005)*
	Kebara Cave, Mt. Carmel, Israel, F Units VI-XII VI (TL) 48.3±3.5 ka VII (TL) 51.9±3.5 ka VIII (TL) 57.3±4 ka IX (TL) 58.4±4 ka X (TL) 61.6±3.6 ka XI (TL) 60.0±3.5 ka XII (TL) 59.5±3.5 ka *(MN1994, VH1998)* X (ESR tooth EU) 60±6 (LU) 64 ka (Schwarz et al 1989) *(BO1992)* VI (AMS) > 48 ka *(TG2003)*	Primary reduction aim, triangular blanks (points and flakes), points hafted, secondarily blades; low % retouch; unipolar recurrent Levallois method predominates over lineal; hearths, burnt seeds, cutmarked bones *(BO1992)*; also radially prepared cores in VII-VIII *(BO1995);* use-wear: points hafted, blades scraped hides and wood, retouched flake scraped and cut wood, flake fragment scraped bone, cortical flake butchered *(SJ1989);* K1-29; Unit XII K2 in dug out grave pit, *Homo neanderthalis*, skull later removed *(BO1992, 1993)*; but *(GR1999)* natural slow decomposition and burial; 1 bone engraved / and V marks *(DS1974)* [=VIII-IX in *GO1992* ?]	MP: *Dicerorhinus hemitoechus);* MP and UP: *Gazella gazella, Alcelaphus sp., Capra aegagrus, Bos primigenius, Capreolus, Dama mesopot., Cervus elaphus, Sus scrofa, Equus cf. caballus, E. hydruntinus, Crocuta crocuta, Hyaena hyaena* (Davis 1977) *(BO1992)* Lentils, legumes gathered, acorn and pistachio shells *(BO1995)* *Neanderthal hyoid modern, hence fully capable of speech (BO1993)*
	Biqat Quneitra, Israel Open air site *(BO1995)* (ESR bovid tooth) (EU) 39.2±4.2 (LU) 53.9±5.9 (Ziaei et al 1990) *(MA1996, TI2000)*	Radially prepared cores (Goren Inbar 1990); not Tabun D, C, B *(BO1992)* or variant of B *(BO1995)*; incised 4 nested semicircles and diagonal lines on flint cortex *(MA1996)*	Large mammals dominant, *Bos primigenius*, equids (80%); rhino, deer, gazelle (20%) (Davis et al 1988) *(BO1995)*

Tabun B (continued)	Amud, Israel (TL 19 flints mean age) B1: **57.6±3.7 ka** B2: **56.5±3.5 ka** B3: sterile layer B4: **68.5±3.4 ka** *(VH1999)* B2-8 (ESR EU) 59±8 (LU) 70±8 B4 (ESR EU) 68 ka (LU) 113±8 ka (Schwarcz & Rink 1998) *(TI2000)* Level B 1-6 (ESR EU) 42±3 to 49±3 (LU) 49±4 to 50±4 ka *(GR1991)*	'Resembles Tabun B' but high % centripetal Levallois (Ohnuma 1992) *(VH1999);* 15 MNI mostly B1, B2 and 1 from B4 *(VH1999)*; A1 partial skeleton, cranium large (1,740 ml), 3 identifiable as *H. neanderthalis* from B1 and B2 *(TI1988, VH1998)*; A7 infant, partial skeleton in niche in wall, 'burial' with red deer maxilla (Hovers et al 1995) but possibly exposed prior to natural burial *(GR1999)*	
	Tor Sabiha and Tor Faraj, Wadi Hisma, Jordan (dry period, probably OIS 4 =) **59 to 71 ka** *(BO1995)* (Useries) 62.4±14 (AAR) 69.5±5 *(TI2000)*	Mixed uni- and bidirectional core reduction (*MA1983);* Tabun B industry (Henry 1998) *(TI2000)*	
	Wadi Hasan 621, central Jordan (E of cent. Negev) (industry) 40-60 ka (PJ1993)	Tabun B industry (PJ1993)	Lacustrine in UP, (Coinman 1993)
	Far'ah II, Nahel Besor, northern Negev, Israel (geostratig) 50 ka (TL) 72.5±1.5 (ESR EU) 49.1±4.1 (LU) 62.2±7.0 (Schwarcz & Rink 1998) *(TI2000)*	Final MP, but same low % Levallois as Tabun D (Rosh Ein Mor, Nahal Aqev) (Gilead & Grigson 1984) *(TI2000)*	Mediterranean biozone, oasis; mostly equids (*Equus hemionis/asinus*; then *Alecelaphus sp, Bos primigenius*; rarer camelid, hippopotamus (Gilead & Grigson 1984)
	Har Karkom, central Negev, Israel Numerous sites 'Levallois Mousterian', such as HK19 *(AE2006)*	HK19: 6 hut floors, Levallois Mousterian flints *(AE2006)*; [3 zoomorphic flints at east entry to one hut, 2 'equid heads' *JBH*]	['Levallois Mousterian' classification covers Tabun D and B in Negev, but Tabun D less % Levallois, so maybe Tabun B Negev ca. 40-70 ka. *JBH*]

Tabun B (continued)	Ksar Akil, Lebanon XXV or XXVI and lower (14C on XXVI above EUP levels) 43.75±1.5 ka *(MA1983)*	Tabon B industry (Copeland 1986) *(CG1989)* or Tabon C or D (TI2000)	
	Dederiyeh Cave, Syria Layers 2-4 (preliminary TL) between **50-70 ka** Layers 8-9 (preliminary TL) between **60-90 ka** *(GC2004)* Living sites, all layers *(CG2004)*	Tabun B industry; cut and percussion marks, burnt bones, 1 gnaw mark = hunting, only hippo, rhino scavenged *(GC2004);* 15 MNI *H. neanderthalis*; Layer 8: *Homo neanderthalis* infant, flexed with limestone slab top of head, triangular flint at heart, 'intentional burial' *(AT1995, ATM1995)*; but probable death by fall into cave *(GR1999)*	Primarily (by NISP) *Capra aegagrus; Cervidae, Cervus elaphus, Gazella gazella; Dama mesopotamica* and less ranked %, Turtle, *Bos primigenius; Dicerorhinus; Equus; Sus scrofa; Panthera pardus* and *leo (GC2004)*
	Geula B Cave, Mt. Carmel, Israel 3 layers: A Layer B1 (14C) 42±1.7 ka Layer B2 (Wreschner 1960, 1967) *(BA2002)*	All 3 levels 'Upper Mousterian' ; A: points, burins, sidescrapers common; B: Levallois points, flakes most common, denticulates; few bone tools; ochre (Wreschner 1980, 1982) *(BA2002, GI1999)*; 3 hominin bone fragments, 'archaic H. sapiens'. between Qafzeh 9 female and Nahal Ein Gev I female *(BA2002*) [ergo not archaic but early *H. sapiens sapiens*?]	Abundant *Hystrix sp.*, plus *Crocuta, Gazella decora, Dama mesopotamica, Cervus sp., Bos primigenius, Sus scrofa* (Angress 1960, Wreschner 1967) *(BA2002)*

	Umm el Tlel, El Kowm, Syria (preliminary ESR and TL for 8 Mousterian layers [Tabun D and B]) **45-75 ka** *(GC2004)* V-13 'butchery site' V-2ßa 'living site' VI-1 'hunting camp/kill site' *(GC2004)*	'Terminal Late MP' or 'Intermediate MP-UP', both Levallois & prismatic blade cores; Umm el Tlel points (Boëda & Muhesen 1993) *(KS1999)*; all assemblages reflect hunting, no scavenging, as at Kebara *(GC2004)* *(GC2004)*	V-VII: primarily Equid (ass) and camel; also gazelle, antelope, rhino, aurochs; 1 *H. neanderthalis (GC2004)* Level VI3b'1: broken Levallois point embedded in vertebra of wild ass *(Equus africanus)*; fossils also indicate hunted dromedary *(BE1999)*
	Douara Cave, Syria – III (AMS) range **40-55 ka** *(GC2004)*	Tabun B *(TI2000)*; cut and percussion marks, burnt bone *(GC2004)*	Predominantly gazelle and wild goat, few Equus, camel, 1 oryx *(GC2004)*
	Jerf Ajla Cave, Syria Upper Layers Layer C1 (TL mean on 5 burnt flints) (31-42.6 ka ave.) **35.6±3.4 ka** // Umm el-Tiel date *(JP1999)*	'Transitional MP-UP' industry *(BO1992, 1989)*	
	Yabrud I, Syria Layers 1-5 *(RA1950)*	Tabun B *(TI2000)*	
	Keoue Cave (Nishiaki n.d.) *(BO1992)*	Tabun B industry *(BO1992)*	
Micro-Mousterian			
	Yabrud I, Syria Layer 5, 9 (see under Tabun B, D)	'Micro-Mousterien' and 'Mousterio-Pre-Aurignacian' *(RA1950)* both in single factor cluster, low % Levallois type tools *(AT2006)*	

Zagros MP			
	Shanidar, Iraq Layer D ca 70 ka *(WJ1982)* Upper part Layer D: (14C) 46 ka and 50 ka, and based on sedimentation, initial occupation ~ 100 ka *(SR1971)* S1: (14C) 46.9±1.5 ka; S5: (14C) 50.6±3 ka *(SY1988)*	'Transitional MP-UP', Levallois and unifacial points on flakes and blades, sidescrapers, borers, similar to Bordes Typical Mousterian;	9 *H. neanderthalis*, S1 crippled, amputated arm = *altruistic behavior*; S1, S2, S3, S5 killed in rock fall, S4 adult male buried in rock niche with flowers/herbs, S8 infant and S6, S7, 2 adult females, bones not in articulation, suggesting secondary burial; no soil samples from other skeletons had such pollen concentrations though did have burrows *(SR1971, SR1975, LA1975*); but superposition ≠ group burial *(GR1989);* but flowers, seeds, etc. stored in burrows by rodents *(SJ1999);* S1 and S5, cranial deformation *(TE1983)*
	Karain Cave, Antalya, Turkey Levels 17-27: (ESR EU) 108±23; (LU) 121±27 ka Level 16 (ESR EU) 61±7; (LU) 63±7 ka (Rink et al 1994) (TI2000)	Zagros type industry (Otte 1995, Yalçinkaya et al 1993) (TI2000)	
	Bisitun, Iraq	(Coon et al 1951, Coon 1957) *(AT2005)*	
	Hazar Merd, Iraq Layer C	(Garrod 1930) *(AT2005)*	
	Kunji, Iraq (14C) > 40 ka *(TI2000)*	(Hole & Flannery 1967) *(AT2005)*	

Upper Paleolithic			
Early or Initial UP—Early Ahmarian 30K-50K 25-40 ka wetter than today; most humid phase 27-30 ka (Gladfelter 1997) *(WJ1999)*	General: hardhammer single platform reduction strategy for blade blanks *(MA1983),* slender elongated interior blades, for El Wad points and retouched blade and bladelet blanks, not yet differentiation into distinct reduction strategies for blades versus bladelets *(FC1988);* fine retouched endscrapers on blades; retouched bladelets common >35%; endscrapers plus burins <40% *(CG1989)*; dominated by UP tool forms (endscrapers, burins, truncations) though may be made on Levallois blanks, but may include MP forms (sidescrapers and denticulates) // Bohunician central Europe (43-36 ka) and Karim Bom, Altai, Siberia (43 ka) *(KS1999)*		
	Boker Tachtit, Negev, Israel Level 1: Level 2: (14C) > **45.49, 46.93±2.42, 47.28±9 ka**; Level 4: (14C) 35.1±4.1 (Marks 1981, Schwarcz et al 1979) *(MA1983)*	Level 1: EUP Level 2: opposed platform Levallois-point, quasi-discoidal, single-platform blade and opposed-platform blade reduction; Emireh points; Level 4: hardhammer non-Levallois single platform for blades, by-product some Levallois points, retouched as in earlier levels (Bordes compared to Australia) *(MA1983);* 'EUP Transitional industry' (BO1989)	Lacustrine environment (Horowitz 1983) Level 1 technology more different than Kebara VI (Tabun B) less different than Korolevo II Complex II, Stranska Skala IIIa-4 Bohunician, with dates **suggesting diffusion from Levant 46-47 ka** to central Europe (Stranska Skala) 42 ka then eastern Europe (Korolovo) 38 ka; the 'Bohunician Behavioral Package' (Tostevin 2000) *(TG2003)*
	Ksar Akil, Lebanon XXIII-XXV (Stage 1) (14C on XXVI below EUP levels) 43.75±1.5 ka *(MA1983)* (est.) basal EUP **~ 50 ka** (Mellars & Tixier 1989) *(KS1999)*	Transitional EUP Stage 1 (XXI-XXV): Levallois technique but UP retouched blades, tools Stage 2a (XIX-XX) Stage 2b (XV/XIV-XVIII) decline Levallois, increase opposed-platform prismatic cores; pointed blades, endscrapers, burins Stage 1 and 2 no bone or antler artifacts (Copeland 1986) *(CG1989, GI1991, KS2001*) perforated shell beads *(KS2001)*	Marine shell food taxa*: Patella* (2b), *Monodonta* (2b); *Acanthocardia tub*. (2b); ornamental taxa: *Nassarius gibbosula* (all levels); *Columbella rustica* (all levels), *Glycymeris* (all levels) *(KS2001)* XXIII ('unique, maybe intrusive') 1 bone, awl incised 14 cutmarks in 7 pairs *(NM1974,CL1977)*

E. Ahmarian continued	Kebara Cave, Mt. Carmel, Israel, E -Units I-IV F-V (AMS) > 46 ka E -IV (AMS) **42.5±1.8 ka** E I-IV 28-42 ka *(BO1992)*	F-V: Mousterian with UP intrusives E-IV-III: Early UP with blades, pointed and retouched + endscrapers; E-II-I: carinated, nosed, shouldered endscrapers, el -Wad points, Aurignacian-like; hearths, burnt seeds, cutmarked bones, bone tools, few lumps of ochre *(BO1992)*	E: *Gazella, Alcelaphas, Dama, Cervus elaphus, Capreolas, Equus, Sus, Bos, Hyenid, Canis, etc.; (GI1991)*
	Üçagizli Cave and Kanal, south central Turkey Layer H: (AMS uncalibr.) 38.9±1.1 ka, 39.4±1.2, 41.4±1.1 (calibr) ~**41-44 ka** Layers B1-B4 (14C) 29-32 ka (uncalibr) *(KS1999, KS2001)*	Layers G-I: EUP Stage 1: single platform blade-bladelet cores, hard hammer; Layers E-F: transitional Layers B1-4: Stage 2 with prismatic blade cores, and soft hammer/indirect; bone and antler tools; *(KS1999)*; perforated shell beads (all levels except D), perforated predatory bird phalanx *(KS 2001, VM2006)*	Fauna dominated by *Capra aegagrus, Dama sp. Capreolus capreolus (KS1999)* Marine shell food taxa*: Patella, Monodonta* (throughout levels); ornamental taxa: *Nassarius gibbosula, Columbella rustica* (all levels), *Glycymeris* (level B) *(KS2001)*
	Qafzeh, Israel – Level VII-IX or D, E	Ahmarian *(CG1989)*, D: Stage 2 UP; E: Stage 1 UP; limestone slab and hand stone smeared with red ochre (Ronen & Vandermeersch 1972) *(BO1997)*	*Gazella, Alcelaphas, Dama, Cervus elaphus, Capreolas, Equus, Sus, Bos (GI1991)*
	Erq el-Ahmar E, F, Israel	Stage 2 UP *(GI1991)*	

	Har Karkom, central Negev, Israel At least 16 sites, including HK86b, HK86a, HK87b, HK203a, HK206a, HK210, HK191a (tool style, EUP, 35-45 ka) *(AE2006, AE2001, AE1996, AE1993)*	'Karkomian—EUP/MP transitional', large blades cut and retouched by Levallois technique, Aurignacian-like backed blades, points, endscrapers *(AE1993, AE2001, 2006)* HK86b: 'Paleolithic sanctuary': spiral circle of standing stones with natural anthropomorphic shapes, some fallen ones, several smaller Z-A stone figurines with retouch, and EUP flints HK86a: several heaps of stones associated with hutfloors; HK87b: several heaps of stones associated with hutfloors; HK203a: traces of pebble drawings or geoglyphs made of heavily patinated flint pebbles; HK210: 53 'zoomorphic and anthropomorphic' (Z-A) stones; Z-A stones on perimeter of a hutfloor and 1 in its floor; between other 2 huts a small circle of Z-A stones with 1 round, mask-shaped in the center *(AE2006, AE2001, AE1996, AE1993)*	[Note: Thus has similarities to EUP Stage 1 sites, such as Boker Tachtit, Levels 1-II, dating ~ 47 ka. JBH]

'Middle UP' **Lagaman** 25-40 ka fully developed blade technology, dominance of retouched and backed blade tools and points; no remnants of Mousterian lithic tradition; lack typical Aurignacian endscrapers and blades; // Qafzeh 9-7 and Ksar Akil 16 *(GI1993)*	Abu Noshra II, southern Sinai, Egypt (14C) **38-39 ka** (was 31-34) *(KS1999, GI1999)*	Lagaman EUP, 1 bone point *(GI1999)*	Marsh environment; gazelle, ibex, equid, wild cattle *(GI1993)*
	Boker A, Negev, Israel (14C) **37.92±0.28 and >33 ka** *(GI1991)*	Lagaman EUP, 42% blades tools, 10% bladelet tools, 20% endscrapers, burins *(GI1999)*	
	Qadesh Barnea, northeast Sinai, Egypt - sites QB9, QB501, QB601 (14C on shell) **32-34 ka** *(GI1993)* QB602: Late UP (maybe variant Aurignacian and maybe ~ 20-25 ka QB8: Geometric Kebaran (14C) 14 ka	Lagaman EUP, flint nodules; sites range from 50% to 80% blade tools (retouched, backed & pointed) and nil bladelet tools; 6-15% endscrapers, burins; 7-26% notches + denticulates; at QB601 ochre extensively used, ostrich eggshell, (but not at 9); 5 *Dentalium* shell pieces; QB9: 1 limestone scraper with // incised lines on dorsal face *(GI1999)*	Marsh environment; fauna probably similar to Abu Noshra *(GI1993)*
	Lagama, Sinai, Egypt VII (14C charcoal) 31.21±0.278, 34.17±3.67, >19 ka *(GI1991)* VIII and IIID (14C shell - corrected) 30.36 ka (range **30-34 ka**) (Bar Yosef & Phillips 1977) *(CG1989)*	Lagaman EUP, VII 56% blade tools, 37% bladelet tools 3% endscrapers, burins; VIII 35, 29, 18%; *(GI1999);* differs from QB: high % small cores, more el-Wad points, few microliths *(GI1993)*; flint artifacts stained with red ochre *(BO1997)*	X: 82 pieces of Dentalium shell, and few shells other levels *(GI1999)*
	Boker BE, Negev, Israel III: (14C) **26-27.5 ka** II: (14C) **24.6-26.9 ka** *(GI1999)* Sde Divshon (?)	Late Lagaman, III 50% blade tools, nil bladelet tools, 20% endscrapers, burins; limestone, basalt grinders for ochre *(GI1999)*	
	Tor Aeid (J432), 0-60 cm; Tor Hamar (J431), layers F-G; Jebel Humeima (J412) horizons II-IV; Tor Fawaz (J403), southwest Jordan *(WH1997)*	Early Ahmarian, stratified over MP; el Wad point use wear = mostly as hafted projectiles, also cutting and scraping (butchering, hide scraping) *(WH1997)*	Tor Hamar: Alder, elm, oak, and abundant grasses (Emery-Barbier 1995); standing water; golden jackal (*Canis aureus*), wild ass (*E. asinus*), gazelle (*G. gazella*), and caprine (*Capra aegagrus and C. ibex*) (Klein 1995) *(WH1997)*

Southern Levantine Negev Non-Aurignacian Non-Ahmarian 20-30 ka	General: Similar to Aurignacian, with multiple reduction strategies, carination, core blanks, scraper and burin toolkit, poor blade technology, and few blade tools, no El Wad points, but higher % non-carinated burins and lower % non-carinated scrapers; missing Aurignacian retouch and bone and antler tools *(WJ2003, 2000; GI1999)*		
Most humid phase of UP 27 to 30 ka *(WJ1999)*	Arkov (D22A) and D27A, Negev, Israel (pollen) 'wet conditions must be prior to Boker BE (27 ka)' = **min. 27-30 ka** *(MA1976, WJ1999, 2003)*	Levantine Aurignacian, D22: 7% blade tools, 1% bladelet tools, 59% endscrapers, burins; D27A: 6, 0, 61% *(GI1999)* or 'Non-Ahmarian' (no Aurignacian retouch) *(MA1976, WJ2003)*	Pine, oak, pistachio and almond, indicating a Mediterranean scrub forest (Horowitz 1976) *(WJ1999)*
	Boker BE, Negev, Israel I (C14) **25.6±0.6 ka** *(GI1991)*	Levantine Aurignacian or 'Non-Ahmarian' (no Aurignacian retouch) *(FC1988, WJ2003)*	
Absence of Negev sites 20 to 25 ka = too dry (Phillips 1994) *(WJ1999)*			
Dry, cool phase 14.5 to 22 ka *(WJ1999)*	Ein Aqev (D31), Negev, Israel 12: (14C) **19.0±1.2 ka** 5-11: (14C) **17-18 ka** G11; maybe DI8 (core blanks used for carinates) *(MA1976, WJ2003)*	Levantine Aurignacian, or 'Non-Ahmarian' (no Aurignacian retouch); hearths, *Dentalium, Nassa gibberula, Mitrella shells;* red and yellow ochre all levels, 3 *Nassa* smeared with ochre *(MA1976, WJ2003)*	*Equus hemionis, Capra sp., Gazella sp., Lepus europeaeus*; ostrich egg shell *(MA1976)*; pollen suggests, dry and cool phase

Levantine Aurignacian or 'Late UP Carinated' 25-32 ka (32-27 wetter, after 27 ka drier) *(CG1989)*	General: multiple reduction strategies (opposed platform for large blades; single platform for bladelets); flake strategy; soft-hammer for 'classic' blade and bladelet products; retouched bladelets; carinated cores for twisted and Dufour bladelets *(FC1988, WJ2003);* blanks into endscrapers and burins = 45-65%; blades into el-Wad points; more bone and antler tools; UP Stage 4 and 3 *(CG1998);* red ochre reported from almost every site dating between 30 ka and 8 ka *(BO1997)*		
	Ksar Akil, Lebanon VII/VIII-XIII (14C) **32 ka** *(CG1989)*	XI-XIII Early Levantine Aurignacian, bone tools; XI, cobble for crushing ochre; VIII-X Later Aurignacian (Copeland 1986) *(GI1991)*	
	Hayonim, Israel – Layer D (14C) **27-29 ka** *(BO1997)*	Levantine Aurignacian, 7% blade tools, 9% bladelet tools, 51% burins, endscrapers; antler and bone awls, points, etc. *(GI1999);* 5 engraved gazelle scapulae(tally marks?) *(DS1974);* several limestone slabs bearing red ochre and black pigment; 2 engraved limestone slabs,1 'speared horse' 'Ys, bi-lines, hooks, fluid lines' overmarked with red ochre; perforated horse and deer teeth, wolf canine, bone pendants (Belfer-Cohen and Bar-Yosef 1981) *(BO1997, MAa1997)*	[Note: 'speared horse' looking right, but also bird of prey looking left]
	Kebara Cave, Mt. Carmel, Israel, Layer D	D: Upper Aurignacian, Stage 4, dominated by endscrapers, carinates; 14% blade tools, nil bladelet tools; 74% endscrapers and burins (Garrod 1957) *(GI1991, BO1992)*	Fauna similar to Kebara E *(GI1991)* 'Aurignacian behavioral package' Levant (Kebara Cave Unit II) and central Europe (Stranska skala IIa–4 & IIIa–3) (Tostevin 2000a, b) *(TG2003)*
	El Wad D, E	E: Lower Aurignacian, Stage 3 D: Upper Aurignacian, Stage 4 *(GI1991, CG1989)*; twin [breast] pendants *(BO1997)*	Fauna C-F: similar to Kebara E plus *Panthera pardus* (leopard) *(GI1991)*
	Erq el-Ahmar D, B, Israel	D: Lower Aurignacian, B: Upper Aurignacian (GI1991); Dentalium shell beads, bone beads *(BO1997)*	

Late Ahmarian	General: multiple reduction strategies (opposed platform for large blades; single platform for bladelets), soft-hammer, 'classic' blade and bladelet products, abundant microliths, bladelets with fine, continuous retouch; backed bladelets and points are rare; large tools include endscrapers, burins, truncated blades *(FC1988)*; *);* red ochre reported from almost every site dating between 30 ka and 8 ka *(BO1997)*		
	Boker BE, Negev, Israel Levels IV, II Boker (D100) Area A Ein Aqev East (D34) *(FC1988)*	Late Ahmarian *(FC1988)* E. Aqev E., *Dentalium* bead *(GI1999)*	
Atlitian 25-33 ka	General: tabular flint burins, steep and carinate scrapers and gravers; backed points of Audi/Chatelperron type; finer retouch than prior levels; UP Stage 5 *(WJ1982)*		
	Ksar Akil, Lebanon VI-VII VI (AMS) **31.2±1.3** and **32.4±1.1** VII (14C) **32.0±1.5** *(MP1989)*	VI-VII Atlitian, UP Stage 5 (Copeland 1986) *(CG1989)*	*Gazella, Dama, Capra, Alcelphas, Cervus elaphus, Capreolus, Equus, Sus, Bos, Canis, Ursus* etc. *(GI1991)*
	Nahal Ein-Gev I, Israel (by cultural style) Late UP ~20-25 ka *(BO1997)*	Atlitian, female *H. sapiens sapiens* burial *(BA1992)* or Aurignacian *(GI1991)*	
	El-Wad C, Mt. Carmel, Israel	Atilian (Stage 5) *(WJ1982)*	

Kebaran ('Mesolithic' or 'Epipaleolithic') 10-30 ka (especially drier and cooler phase, 22-15.5 ka; wetter 17-12 ka) (CG1989)	General: high % blade blanks by punch technique; microlithic triangular points; retouched pointed and/or truncated bladelets; scrapers; gravers, backed knives, becs; prismatic burins; UP Stage 6 (Neuville 1934, 1951; Copeland 1968) *(AT2005;);* red ochre reported from almost every site dating between 30 ka and 8 ka *(BO1997)*		
	Kebara Cave, Mt. Carmel, Israel, Layer C	C: Kebaran type site B: Natufian A: Historical *(BO1992)*	
Early Kebaran 20-30 ka [Note: Every listed Early Kebaran site has symbolic art as well as red ochre. JBH]	Ksar Akil, Lebanon (Ewing Levels) I-V (Tixier 1970) *(AT2005)* I (AMS 1 sample 5 layers) 22.05±0.36 to 23.17±0.4 III (AMS) 21-29 ka with 8ac (AMS) **29.3±0.8** IV (AMS) 30.25±0.85 ka *(MP1989)*	Kebaran (Tixier 1970) *(CG1989)*; Level I-II, *H. sapiens sapiens* burial *(HF1980);* Ewing Level III (Tixer 8c) gazelle metatarsal awl 10 cm, 167 / incisions in 5 columns, 32-35 marks each, some V, X's, hooks *(TJ1974)*	
	Ohalo II, Israel (14C) 19.5 ka (calibr.) **22.5-23.5 ka** (Nadel & Hershkovitz 1991) *(BA1992)*	Early Kebaran, male *H. sapiens sapiens* burial with gazelle bone polished and incised with // marks behind head and similarly incised wooden object *(ND2006)*; bone tools, grinding stone, sinkers, brush huts with grass bedding, hearths, twisted fiber, few standing stones, e.g. elongated amygdaloid shape outside perimeter of huts and small erect stones under floors; hundreds of Dentaliumand Columbella shell beads *(ND2003, 2004*)	Primarily *Gazella gazella*, also fallow deer, fox, hare, waterfowl, fish; gathered wild barley and wheat which were charred (for groats?) *(ND2004)*
	Jiita Cave, Lebanon Level II probably same strata and age as (only 4 km. away) Ksar Akil III	Level II, Early Kebaran (pre-Tabun C): 3 gazelle bone tools: 1 awl, polished, incised with 1 row 'zigzags',2nd row 'zigzags and Vs', 3rd row 'several bi-lines,1 X' (like Ksar Akil); ochre *(CL1977)*	*Dentalium* beads, other shells with natural or intentional perforations *(CL1977)* [Note: zigzag, V, bi-lines, X similar to UP(E) geometric signs. JBH]
	Urkan e-Rub IIa, Israel (14C) 14.44±0.15 ka, but is too young in light of Early Kebaran tool typology *(HE1990)*	Early Kebaran, abundance of shell beads, polished limestone pebble (not local) engraved with 8 sets of parallel lines, 3 with 'ladders'; obverse 2 'ladders' in V with fill of cross-hatch *(HE1990)*; may represent gazelle drive corridors *(BO1997)*	[Note. Face A: 5 sets of arcing parallel lines ('rainbows'), 2 'ladder pillars', 1 merged 'ladder' and 'rainbow' = heaven?; Face B: 2 'ladders' in V and filled with cross-hatch = vulva-earth? JBH]

	Ein Gev I and II, Israel 16 ka Ein Gev III (Geometric Kebaran) (Ahrensburg & Bar-Yosef 1973) *(BA1992)*	Kebaran; Ein Gev I female *H. sapiens sapiens* buried in hut, flexed on right side, 3 bovid horns near left shoulder *(BA1992, GI1991)*	Ein Gev I fauna 43% gazelle, deer (fallow, red, roe) 36%, ovicaprines 15.5%, 4.5% cattle, 1% pig; and similar species at EGII and III (Moore 1973)
Geometric Kebaran 13-20 ka	Wadi Mataha, southern Jordan (14C) 14.1±0.13 (calibr.) **16,457-17,579 ka**	Geometric Kebaran, adult *male H. sapiens sapiens burial with fragmentary juvenile* (Stock et al 2005)	
	Doura Cave, Syria Layers A, B *(AT2005)*	Large % tools on blade and bladelet blanks often by punch; micro-gravers, geometrics, and backed and truncated bladelets, various scrapers and gravers on blade blanks *(AT2005)*	
	Yabrud III, Syria Levels 4, 6, 7 (Rust 1950) *(AT2005)*	Layer 7 25% of tools and cores microlithic, Yabrud II Level 4: obsidian flakes, perforated shell beads, ochre, grinding stones, bitumen on few flint tools *(RA1950, GI1999)*	
	Neve David, Israel (14C) 12.61-13.4 ka (calibr.) **~15 ka** (Kaufman 1989) *(BA1992)*	Geometric Kebaran; 2 fragmentary skeletons *H. sapiens sapiens* covered with a few mortars and stone bowls *(BA1992, BO1997)*	
	Hayonim, Israel – C	Kebaran *(GI1991)*	
	Qasr Kharaneh IV, Jordan Phases A, B, C, D (based on tool and other assemblages) A: Ancient Kebaran B: Classic Kebaran C: Geometric Kebaran D: Final Geometric Kebaran And A-D probably ~12-20 ka *(MM1988)*	Geometric Kebaran, Phase B: 2 skeletons buried beneath living floor, 1 with 2 medium-sized stones over head and 2 over legs; Phase D: *Dentalium* shells, several pieces of ochre; engraved bone radius incised with 9 regular incisions *(MM1988)*	Phase A: equid, gazelle, tortoise, hare' Phase D: gazelle, equid, rarer fox, hare, cattle, tortoise *(MM1988)*
	Wadi Dhobai K, Jordan (Waechter & Seton-Williams 1938) *(AT2005)*	Kebaran, crested blades, tanged arrowheads; hut *stone circles*, with orthostats (structural?), few beads (W &S-W 1938)	

Zagros UP			
Baradostian (14C) 25-36 ka ***(WJ1982)***	General: side, end, nosed scrapers, backed bladelets, 'Arjenah points' ~ Font Eves or Krems point; little bonework, grinders for ochre pigment *(WJ1982)*		
	Yafteh, Gar Arjenah and Pa Sangar Caves, Luristan, Iran Yafteh (14C) 40 ka and 32.85±2.9 ka and 27.46±1.15 ka *(WJ1982)*	Baradostian *(WJ1982)*	
	Shanidar Cave, Iraq Layer C (14C) 33.49±0.6 ka and 31.35±1.0 ka *(WJ1982)*	Baradostian type site, scrapers, gravers/burins, few bone pints and awls *(SR1971)*	
Zarzian	General: geometric microliths, microburins, gravers end scrapers, distinctive notched blades, few shouldered points and bone awls *(WJ1982)*		
	Öküzini Cave, s. w. Turkey EpiPaleolithic ~13-14 ka (Yalinkaya et al 1995) *(MAa1997)*	'Epipaleolithic', 2 engraved pebbles: 1st 'aurochs, speared'; 2nd 3 sets of 4x8x8'ladder' patterns; obverse 'ladder corridor' enters circle with small circles around interior perimeter, 'intentional cumulative marking' *(BO1997, MAa1997)* latter may represent corridors for gazelle drives *(BO1997)*	Primarily ibex and wild sheep, also gazelle, deer and hare, but no aurochs (Leotard) *(MAa1997)*
	Zarzi Cave, Iraq Layer B	Final UP, microlithic tools (Garrod 1939) *(AT2005)*	
	Shanidar Cave, Iraq Layer B2 (14C) 10.05±0.4 ka *(WJ1982)*	Zarzian, mesolithic *(SR1971)*	
	Wawasi, Ghar-I-Khar, Pa Sangar, Iran	Zarzian	

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