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Edited by Assaf Yasur-Landau , Eric H. Cline , Yorke Rowan
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PART ONE

ONE

THE LOWER AND MIDDLE PALEOLITHIC
OF THE SOUTHERN LEVANT

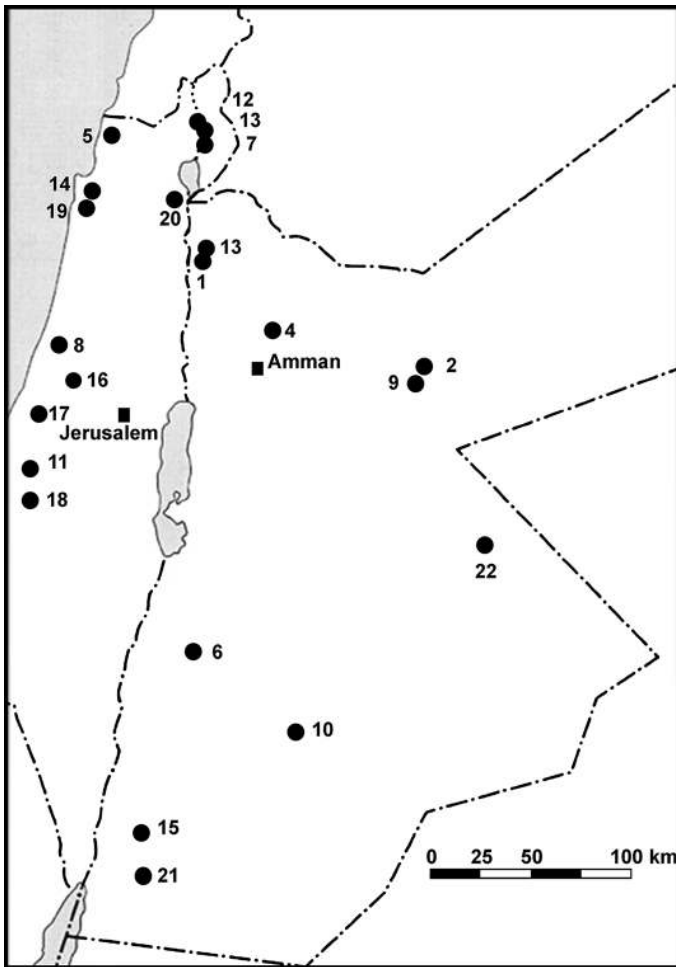
GARY O. ROLLEFSON

The early evolution of human ancestry occurred in Africa, and sometime near the Plio-Pleistocene boundary members of *Homo erectus* grade first ventured outside the African continent. The migration must have passed through southwestern Asia, marking the beginning of a long and gradual evolution both physically and culturally in what is today the southern Levant. Although evidence for the earliest emergence into the region is rare, recent advances in chronometric dating have placed the changing trajectories of both cultural and physical evolution on firmer foundations. The ensuing developments have become more numerous, continuous, and understandable during the Lower and Middle Paleolithic periods through the disappearance of Archaic *Homo sapiens* at the beginning of the Upper Paleolithic, some 45,000 years ago.

THE LOWER PALEOLITHIC PERIOD IN THE SOUTHERN LEVANT

The Early Lower Paleolithic/Early Acheulian

The discovery of hominin occupation in the cave at Dmanisi in the Caucasus in Georgia, dated to about 1.8 million years ago (Lordkipanidze et al. 2013), has important implications for the initial presence of hominins in the Levant, since it is likely that the emergence of *Homo erectus* grade from its African homeland would have passed through this part of southwestern Asia.



1.1. The location of principal Lower Paleolithic sites discussed in this chapter: (1) Abu el-Khas; (2) Azraq Oasis (‘Ain al-Assad, ‘Ain Soda, C-Spring, Druze Marsh); (3) Berekhat Ram; (4) Dauqara; (5) Evron Quarry; (6) Fjayj; (7) Gesher Benot Ya’aqov; (8) Holon; (9) Jebel Uwaynid; (10) al-Jafr Basin; (11) Kfar Menachem; (12) Ma’ayan Barukh; (13) Mashari’a; (14) Misliya Cave; (15) Qalka; (16) Qesem Cave; (17) Revadim; (18) Bizat Ruhama; (19) Tabun; (20) ‘Ubeidiya; (21) Wadi Rum; and (22) Wadi as-Sirhan. (Map by G. O. Rollefson. Courtesy of the ‘Ain al-Assad Archaeological Project.)

At the present time, the earliest solid evidence for early hominin habitation in the Levant is at ‘Ubeidiya (Fig. 1.1:20), where *Homo erectus*-grade exploitation of an African type of fauna has been dated to 1.2–1.6 million years ago (by reversed polarity, faunal inventory, and an electron spin resonance [ESR] date), so earlier evidence should exist somewhere in the southern Levantine region. The earliest layers at ‘Ubeidiya contain lithic assemblages that are similar to Olduvai Bed II (with the same age range) and are “large enough to suggest that they may indicate the presence of an early group of hominins that did not produce bifaces” (Bar-Yosef and Belmaker 2011:

1321). Assemblages higher in the stratigraphy are techno-typologically Early Acheulian, with the use of the hard hammer technique to produce relatively crudely fashioned bifaces and trihedrals in addition to other core-and-flake tools.

In a small sounding at Evron Quarry (Fig. 1.1:5), a limited collection of stratified artifacts without bifaces was dated by ESR (Porat and Ronen 2002) and paleomagnetism to ca. 1.0 million years ago, although nearby there were non-stratified bifaces of Early Acheulian aspect (Bar-Yosef and Belmaker 2011: 1324). On the eastern side of the Jordan Valley, Linda Villiers collected samples from a large redeposited surface site at Abu el-Khas (Fig. 1.1:1). There appeared to be two groups, one of which was Late Acheulian, but the other in her estimation shares techno-typological affinities with the Early Acheulian at 'Ubeidiya and the later site at Latamne in Syria (Villiers 1983: 34).

Bizat Ruhama (Fig. 1.1:18) is an intriguing locus of a rich "microlithic" assemblage (Zaidner, Ronen, and Burdukiewicz 2003) without bifaces that Ofer Bar-Yosef and Miriam Belmaker assign to a "core-and-flake" industry that, according to thermoluminescence (TL) and paleomagnetism probably falls between 990,000 and 850,000 years ago (2011: 1324). A site in the Dauqara Formation (Fig. 1.1:4) on the banks of the Zarqa River in Jordan has also produced a "core-and-flake" assemblage of 243 artifacts of Lower Paleolithic aspect, including one chopper but no bifaces (Parenti et al. 1997). In view of the associated remains of *Mammuthus meridionalis*, Claude Guérin dates the formation (and thus the artifacts) to about 1 million years ago (Parenti et al. 1997: 20). The authors suggest that the industry may be much older and might represent "a more advanced phase than the 'Ubeidiya Developed Olduvian" (Parenti et al. 1997: 19). In 2015, Fabio Parenti and his team excavated a new locality nearby and encountered another core-and-flake assemblage with choppers (but no bifaces) that may be considerably older in view of the stratigraphic position in the Dauqara Formation (F. Parenti, pers. comm., 2015).

Elsewhere in Jordan, Norman Whalen and Christopher Kolly identified thirty-eight Lower Paleolithic surface sites on the western reaches of the Wadi as-Sirhan (Fig. 1.1:22). Based on the presence or absence of bifaces and the degree of weathering, the collections were assigned to the "Early Acheulian" or the "Middle Acheulian," although the former term was due to the absence of bifaces "in the lowest levels of the Early Acheulian at . . . Ubeidiya [*sic*]" (Whalen and Kolly 2001: 13). No firm evidence of an Early Pleistocene age was found. In the red sandstone canyons of Wadi Rum and its adjacent vicinity (Fig. 1.1:21), several surface sites have been assigned to the Early Acheulian based on morphology, manufacturing technique, and weathering (Fabiano and Primiceri 2001; Succi Fabiani 2001).

The Middle Acheulian

Middle Acheulian sites are as rare in the southern Levant as those assigned to the Early Acheulian period. Perhaps the most widely known is Gesher Benot Ya'aqov (Fig. 1.1:7), located on the eastern side of the present Jordan River, though during its occupation it was on the shore of a lake (Bar-Yosef and Belmaker 2011: 1324). Despite the locally abundant flint resources, the Middle Acheulian assemblage of basalt cleavers (among other bifaces) was manufactured on stout flakes in a way common in Africa but nowhere else in the southern Levant; there is speculation that this might represent an Early Pleistocene incursion of a group of African hunters into the southern Levant (Goren-Inbar and Saragusti 1996). In contrast to most Middle Acheulian sites throughout Africa and Eurasia, there is evidence that fire was well controlled by the *Homo erectus*-grade inhabitants (Alperson-Afil 2008). Potassium-argon dating and paleomagnetic studies indicate a date of ca. 0.9 million years ago (Shea 2010: 58).

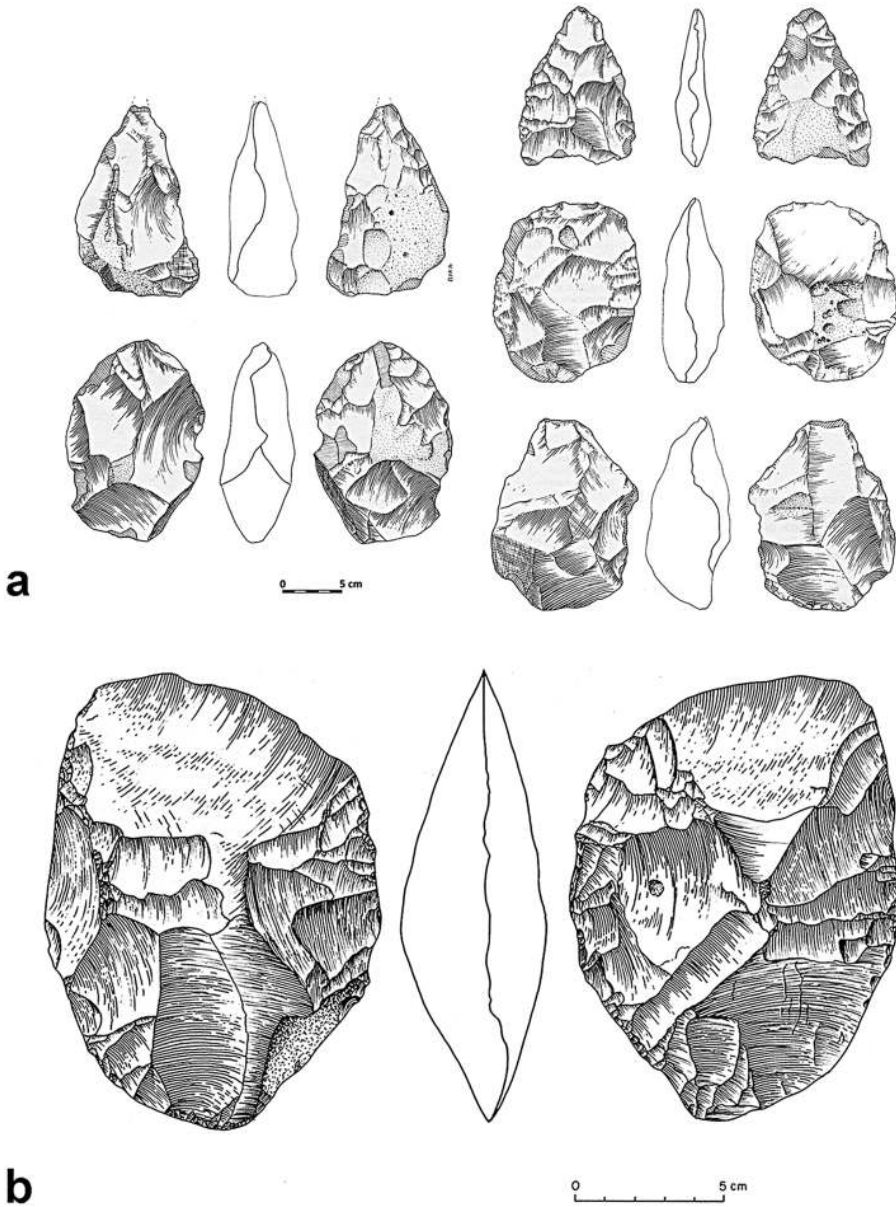
Elsewhere in the Jordan Valley, there are reports of Middle Acheulian bifaces and other artifacts in two localities at Mashari'a (Fig. 1.1:13) based on the large size of the pieces, as well as their location in a formation that underlies Late Acheulian material (Macumber 1992; Macumber and Edwards 1997). Below Jebel Uwaynid (Fig. 1.1:9), in a drainage leading to the Azraq paleolake in eastern Jordan, numerous eroded bifaces of large dimensions and bearing hard hammer technique (Fig. 1.2) also indicate a Middle Acheulian presence (Rollefson 1984).

In the 'Uyun al-Qadim area in the northeastern edge of the al-Jafr Basin (Fig. 1.1:10) in southern Jordan, Philip Wilke, Leslie Quintero, and Jason Rech surveyed seven densely concentrated surface assemblages dominated by bifacial cleavers in what was a wetland environment fed by springs emanating from the eastern escarpment (Wilke, Quintero, and Rech 2010). Four of the sites (J-25, J-83, J-92, and J-140) produced very large bifacial cleavers coarsely fashioned from local flint nodules that contrasted in technique and size from other assemblages that were smaller and demonstrated more refined production skills (Fig. 1.3). For these reasons, the researchers assigned the assemblages to the Middle Acheulian (Quintero and Wilke 2014: 16).

Three surface sites in the Wadi Rum area (see Fig. 1.1:21) have been assigned to the Middle Acheulian based on geochronological circumstances and techno-typology, including one at the base of Jebel al-Hattiya and two others on terraces along the Wadi Harad (Belmonte et al. 1992; Pollarolo 2003; Succi Fabiani and Fabiano 2004).

The Late Acheulian

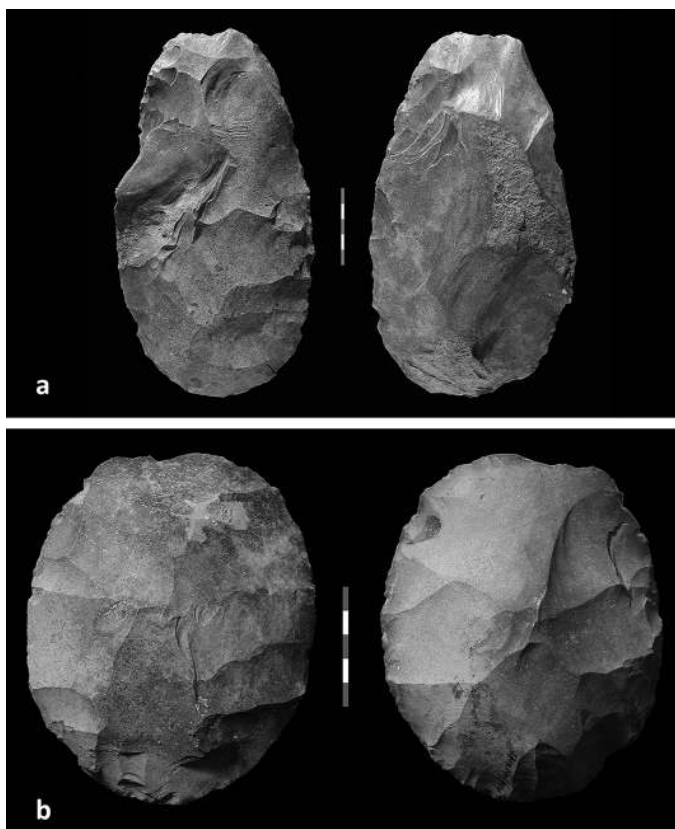
Late Acheulian sites are numerous throughout the southern Levant, and the assemblages show considerable diversity in terms of the use of Levallois techniques to produce blades, flakes, and points, as well as tool production



1.2. (a) Middle Acheulian bifaces from Jebel Uwaynid; and (b) a Late Acheulian bifacial cleaver from 'Ain al-Assad. (Drawings by B. Byrd. Courtesy of the Jebel Uwaynid and 'Ain al-Assad Archaeological Projects.)

and discard during the latter part of the Middle Pleistocene, particularly between ca. 400,000 and 250,000 years ago.

Deep stratified cave deposits at Tabun (Fig. 1.1:19) have provided useful records of changes in lithic production during the Late Acheulian and even through the Middle Paleolithic. Chronometric dating using optically stimulated



1.3. Middle Acheulian bifaces from 'Uyun al-Qadim: (a) one from Site J-92; and (b) one from Site J-140. (Photos by G. O. Rollefson. Courtesy of the Jafr Prehistoric Archaeology Project.)

luminescence, TL, uranium series, and ESR have provided estimates of absolute dates, although the results of the different approaches are not always compatible with each other. A good case in point is the long sequence at Tabun, where TL dates on burned flint fit the stratigraphic order fairly well (Table 1.1), but ESR results were consistently significantly younger by tens of thousands of years (Mercier and Valladas 2003: fig. 2). Of particular importance here is the customary use of the Tabun sequence to “date” other assemblages based on technology, particularly during the Middle Paleolithic (see below).

A major distinction during the Late Acheulian is the presence of the Acheulo-Yabrudian complex along the Mediterranean coast of Israel and Lebanon and into the highlands of southern Syria, characterized by interfingered layers of assemblages with bifaces (Acheulian), Yabrudian (scraper-rich assemblages with scant or absent numbers of bifaces), and a blade-rich Amudian/Pre-Aurignacian industry (Jelinek 1982). Outside of this narrow strip, there is only a Late Acheulian industry in the Jordan Valley and across the entirety of the Jordanian countryside. The Acheulo-Yabrudian complex clearly has roots in the

TABLE 1.1. *Southern Levant Lower and Middle Paleolithic chronometric dates from Tabun Cave based on TL assays (after Mercier and Valladas 2003: tables 1, 2) compared with ESR dates (Grün et al. 1991).*

TL Dates		ESR Early Uptake	ESR Linear Uptake
Unit/Layer	Mean Age (Years Ago)	Age (Years Ago)	Age (Years Ago)
Unit I/C	165,000 ± 16,000	ca. 124,000	ca. 145,000
Unit II/D	196,000 ± 21,000	–	–
Unit V/D	222,000 ± 27,000	–	–
Unit IX/D	256,000 ± 26,000	–	–
Unit X/Ea	267,000 ± 22,000	–	–
Unit XI/Ea	264,000 ± 28,000	–	–
Unit XII/Eb	324,000 ± 31,000	180,000 ± 32,000	195,000 ± 37,000
Unit XIII/Ed	302,000 ± 27,000	149,000 ± 17,000	191,000 ± 28,000
Probable top of F	247,000 ± 27,000	–	–
Top F/Bottom Ed	317,000 ± 36,000	–	–
Bottom of F	315,000 ± 20,000	–	–
Bottom of F	324,000 ± 22,000	–	–
Bottom XIV/Bed 8o	415,000 ± 27,000	–	–

earlier Late Acheulian of the coastal strip, but why this development occurred only in this restricted region remains enigmatic. The impetus to develop a scraper-rich industry and a relatively delicate bladelikey industry is not known; but, whatever the reason, populations elsewhere did not answer the same call.

The Acheulo-Yabrudian complex was first noted at Tabun (Garrod and Bate 1937) and Yabrud in Syria (Rust 1950); new excavations at Tabun greatly refined the understanding of the complex, which was renamed the Mugharan Tradition (Jelinek 1982). Although found at Jamal Cave (Weinstein-Evron et al. 1999) in the Wadi al-Mughara, only 100 m downslope from Tabun, and at Zuttiyeh (Schwarz, Goldberg, and Blackwell 1980) in the Galilee area, stunning new evidence of the Acheulo-Yabrudian comes from Qesem Cave (Fig. 1.1:16) (e.g., Gopher et al. 2005). Here, a 7.5 m stratigraphic section of this complex has been investigated since 2001, and the results have been exhilarating in terms of the scope of data relevant to the intensity and duration of recurrent occupation of the site.

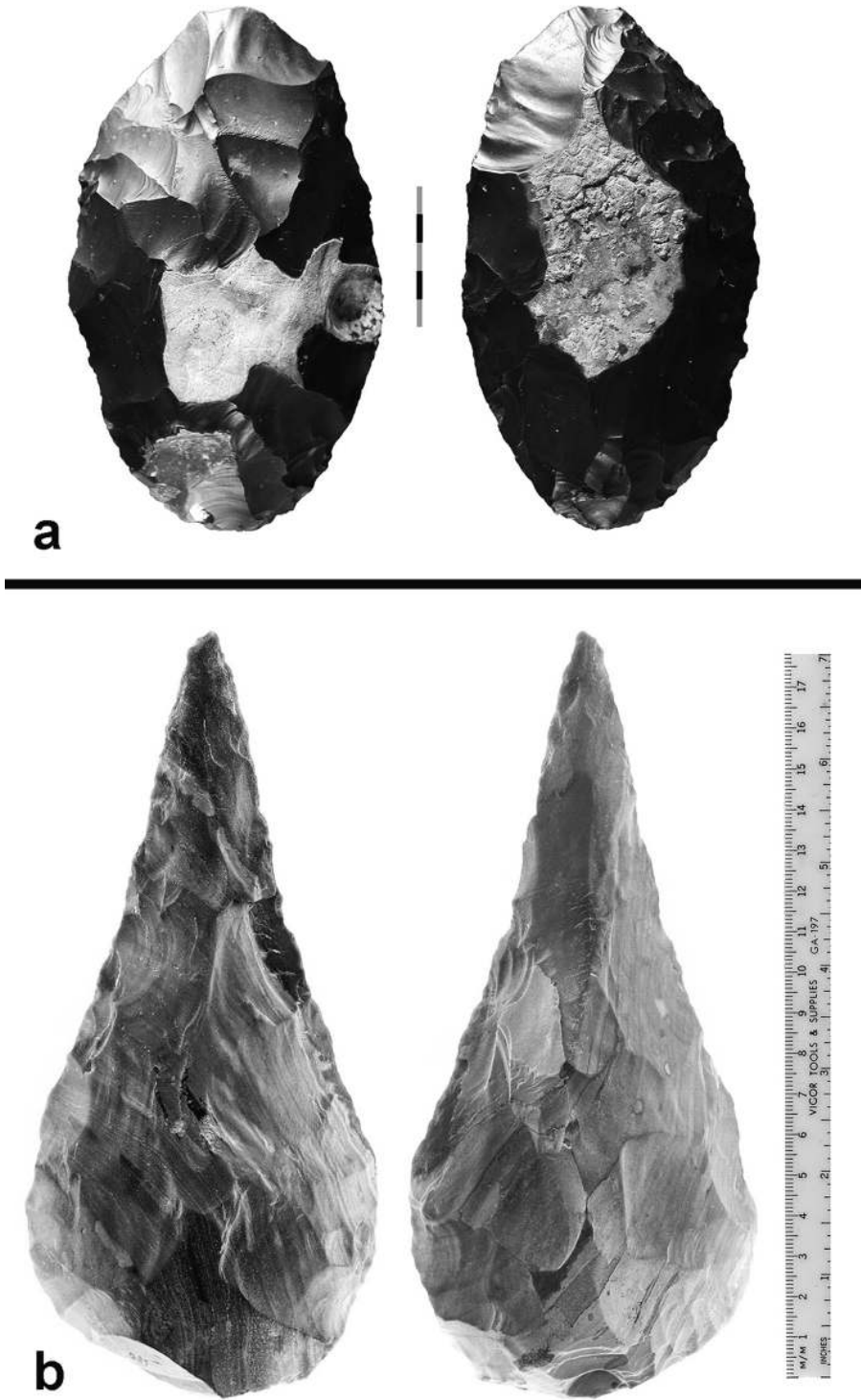
While the beginning of the Late Acheulian outside of the Acheulo-Yabrudian complex has not been established by chronometric dating, the beginning and end of the Acheulo-Yabrudian has been defined on the basis of several methods, although once again there is some disagreement among some dates. Avi Gopher and his team (2010) used uranium-thorium dating to produce fifty-four dates for speleothems from Qesem Cave that spanned a

general range of 400,000 years ago at the beginning of the sequence and 200,000 years ago at the end. This general range is supported by uranium-thorium dates above the Acheulo-Yabrudian layer at Jamal Cave, and although there are serious discrepancies in the results of various methods used at Tabun, there are also patterns that generally coincide with the uranium-thorium dates from Qesem Cave (Gopher et al. 2010: 653–4; Rink et al. 2004).

Areas where the Acheulo-Yabrudian complex has not been found evidently witness a continuation of the earlier Late Acheulian trajectory of changes in stone tool manufacture. The Late Acheulian layer of Arthur Jelinek's Unit XIV (which is near the beginning of the sequence and beneath the Acheulo-Yabrudian layers) has a TL date of $415,000 \pm 27,000$ years ago (Mercier et al. 2000: 732), which fits the stratigraphy of the site, and the beginning of the Acheulo-Yabrudian layers above it at Tabun and Qesem Cave. (This does not, on the other hand, provide a firm date for the beginning of the Late Acheulian.) The end of the Late Acheulian at Holon (Fig. 1.1:8) has been dated by ESR to $215,000 \pm 30,000$ years ago (Porat et al. 2002), indicating that the Late Acheulian spans the range of time of the Acheulo-Yabrudian phenomenon.

The Late Acheulian *sensu stricto* at Revadim (Fig. 1.1:17) and Holon (see Fig. 1.1:8) appears to have little evidence of the use of Levallois techniques (Marder et al. 1999: table 2; Chazan 2000: 14), a situation that also characterizes the Late Acheulian of Tabun (Jelinek 1982: table 1). The situation is very different in the eastern desert of Jordan, where the Levallois indices at 'Ain Sawda are quite high (Rollefson, Quintero, and Wilke 2006: 66), as they are in the Azraq ad-Druze marsh deposits (Nowell 2014: 28) and at Spring C in the southern oasis of Azraq al-Shishan (Copeland 1989; 1991). The combination of high bifacial cleaver content (Fig. 1.4), as well as the intensive use of Levallois techniques, led Lorraine Copeland to propose the term "Desert Wadi Acheulian" for the eastern assemblages (Copeland 1988: 68–9; Copeland and Hours 1988: 303).

In view of the high Levallois content in Late Acheulian sites in the Jordan Valley at Ma'ayan Barukh (Ronen et al. 1980) and to the east of the rift, including Berekhat Ram (Goren-Inbar 1985), Fjayj (Rollefson 1981), Qalka (Fig. 1.1:15) (Henry 1995), and the al-Jafr and Azraq sites (Rollefson, Quintero, and Wilke 2006; Quintero, Wilke, and Rollefson 2007: tables 1, 2; Quintero and Wilke 2014), there seems to be some cultural "boundary" between the coastal region of the southern Levant and the interior of the region, a cultural separation strongly supported by the elevated bifacial cleaver counts in the east (e.g., Rollefson, Quintero, and Wilke 2005; 2006). Bar-Yosef (1987) stressed the importance of a Levantine corridor that facilitated movement of populations and ideas out of Africa and into southwestern Asia. The identification and characterization of the eastern Jordanian Late Acheulian sites could signal the presence of another corridor that followed a series of shallow wetland basins¹



1.4. (a) Large Late Acheulian bifacial cleaver from 'Ain Sawda; and (b) Late Acheulian Micoquian piercer from 'Ain Sawda (Photo [a] by G. Rollefson. Photo [b] by L. Quintero, P. Wilke, J. Quintero, and G. O. Rollefson. Courtesy of the 'Ain Sawda Archaeological Project.)