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14 Stone artefacts of the European Lower Palaeolithic: a short note[1]

G. de Mortillet regarded lithic artefacts as a measure of human evolution. He saw this progression as unilinear and without regional differences, Acheulean handaxes characterized the Lower Palaeolithic and especially rough handaxes were thought to represent the earliest stage named Chellean (De Mortillet 1883). By introducing several Acheulean substages Breuil not only modified this subdivision but first of all and contrary to the spirit of De Mortillet's unilinear evolution he constructed various cultural traditions: parallel to the "biface culture" (Abbevillian, Acheulean) existed a "flake culture" (Clactonian, Levalloisian), each with its own geographical and environmental distribution (Breuil 1932).

Today both the idea that Lower Palaeolithic artefacts neatly represent stages of human evolution as well as the assumption that they characterize different cultural traditions are not very popular among archaeologists. Various contributions in this volume underline the notion that Lower Palaeolithic artefacts do not represent clear chronological units or historical traditions. This may be one of the reasons why less attention is paid to lithic artefacts than, for instance, to faunal remains or environmental data. However, stone artefacts form by far the most common category of finds from the Lower Palaeolithic. Their presence testifies to the presence of humans, and stone artefacts are the only truly durable markers of the earliest occupation of Europe. The oldest sites contain lithic artefacts, characterized by flakes with sharp cutting edges that enabled hominids to gain access to meat, an adaptational advantage that allowed a fast population increase and subsequent extension of early hominids into Eurasia.

Artefacts and Non-Artefacts

Since the well-known eolith discussion at the beginning of the twentieth century (Rutot 1902; see also Adrian 1948) it is common knowledge that there is a large grey area where no objective criteria to distinguish artefacts from natural products apply. The products of volcanic activities serve as an example; these include the so called tephrofacts discussed in this volume by Raynal, Magoga and Bindon (see also: Bosinski *et al.* 1980; Bonifay 1991). Also in river gravels and stone lines (*cailloutis*) it is not always possible to separate artefacts from non-artefacts (cf. Schmude 1992). All attempts to clarify the differences between artefacts and natural products (cf. Pattersons 1983; Kulemeyer 1986; Albrecht *et al.* 1994) are hampered by the fact that Lower Palaeolithic stone working techniques were so simple that they could easily be imitated by natural processes, such as fracture during volcanic eruptions and rock falls and by stones hitting each other in high energy fluvial contexts (cf. Roebroeks 1986; 1994; Roebroeks and Van Kolfschoten, this volume). In such a context the necessarily rigorous selection of artefacts will result in a small series of lithics that might represent only a fraction of those pieces originally made by hominids (cf. Gaudzinski, in press).

Somewhat better conditions exist at sites in fine-grained shore or river bank sediments (Miesenheim I: Turner, in press), travertine sands (Bilzingsleben: Mania and Weber 1986) or loess deposits (Achenheim: Junkmanns 1991; 1995).

Raw Materials

Virtually all Lower Palaeolithic stone artefacts are made out of silicified rocks which occurred at or close to the sites. The term "local", which one often encounters in the scientific literature, should be restricted to sites directly situated on the raw material outcrops, which often have the character of a workshop. In the European Lower Palaeolithic such sites are rare, Cagny-la-Garenne and Boxgrove being two examples of this category. In many cases the siliceous rocks which hominids utilized did not occur at the site itself but at a distance of a few kilometres (Floss 1994). Isolated raw materials from distances of about 20 km (Orgnac), up to 30 km (Terra Amata) or even from "larger distances" (Kudaro I) are exceptions, indicating that it was unusual to transport lithic artefacts from one site to another.

There is a functional relationship between tool-types and types of raw material. The numerous small flakes are predominantly from homogeneous fine-grained siliceous rocks. In contrast, cleavers and pebble tools are mostly made out of tough, coarse materials. In the few cases where "pebble tools" were made of flint, we might be dealing not with tools but with cores for flake production (cf. the "pebble cores" from 'Ubeidiya: Bar-Yosef and Goren-Inbar

1993). The choice of raw material for bifaces is not as clear cut. Many of them are on quartzite and basalt, like the cleavers and pebble tools, while in flint-rich regions there are numerous bifaces made on brittle flint. Bifaces were also made out of bone as is well documented at sites including Fontana Ranuccio, Malagrotta.

The stratigraphic successions of Lower Palaeolithic levels, in Europe for instance Petralona, Orgnac and Tautavel, show that the choice of raw materials developed through time. In the upper layers of these sites the amount of homogeneous siliceous rocks is higher than in the lower layer.

Flaking Techniques

The characteristic small flakes of the Lower Palaeolithic were struck from small to medium-sized cores. The striking platform may have been prepared by one or a few blows, but the reduction face was not prepared and became irregular during flaking. Correspondingly there is no difference between preferential and preparatory flakes. Core reduction was realised by direct "hard" percussion. Low quality rocks like quartz were also worked in a bipolar way, resulting in specific cores and flake types with large straight distal and proximal extremities which may be splintered and look like *pieces esquillées* (Kobayashi 1975).

Hammerstones seem to have been chosen *ad hoc* and subsequently abandoned; hammerstones with clear concentrations of percussion scars testifying to a longer use, are rare. In later phases of the Lower Palaeolithic larger massive flakes with thick striking platforms were produced in the special Clactonian technique described first in England (Clacton-on-Sea, Swanscombe etc.).

At the end of the Lower Palaeolithic elongated flat flakes occasionally are present and were produced from cores with prepared reduction faces. Such prepared cores are known for instance from Cagny-la-Garenne, Lunel Viel and from Kärlich-Seeufer, where they occasionally display a convex prepared reduction face and a prepared-striking platform. Consequently there is a difference between preferential and preparatory flakes. This Levallois technique continues and subsequently develops in the Middle Palaeolithic.

Retouched Flakes

Flakes served as cutting tools, their sharp edges being used without retouching and often displaying signs of use. A characteristic phenomenon of the Lower Palaeolithic are smaller flakes with notched and/or denticulated retouched edges. These small tools are very numerous in every more important inventory; they reflect a kind of activity that was wide-spread and common all over the Lower Palaeolithic, presumably wood working. As a result of their function these small tools are irregulary shaped and difficult to classify. They therefore gave the impression of Lower Palaeolithic tools being "unstandardized". Continuously retouched working edges are rare in these assemblages. The British site High Lodge is an exception to these observations about Lower Palaeolithic knapping techniques, tool types and working edges, and remains an enigmatic phenomenon (Ashton *et al.* 1992).

At High Lodge flakes with slightly convex or almost straight scraper edges are common and may be classified as simple or transversal side-scrapers. There are also *racloirs déjétés* (*Spitzschaber*) with almost straight edges. Thick elongated points with irregularly retouched denticulated and notched edges are usually classified as Quinson points. Small and short end-scrapers with regularly retouched scraper-ends are common.

In bigger inventories (for instance Bilzingsleben and Dmanisi) burins occur, sometimes multiple ones, and some on truncations. The burin bevels sometimes shows signs of use; but in general, intentional burins are an exception though in the European Lower Palaeolithic.

Pebble Tools

A meaningful classification of pebble tools is a difficult enterprise. The traditional subdivision into unifacial choppers and bifacially shaped chopping tools is the most convenient classification. Almost all the chopping tools are alternately worked and surely were not cutting tools. Additional subdivisions focusing on the amount of the worked surface, the amount of cortex, or the shape of the working edge are possible and useful in the description of big series as for instance from surface collections and from terrace bodies (see for example Collina-Girard 1976; Tavoso 1978; Krüger 1994; Fiedler 1994).

Primary context sites with a variety of find material, including bones, in general contain only a limited number of pebble tools. Hence it does not seem urgent to elaborate a more sophisticated subdivision of these simple tools.

Cleavers

Cleavers are subdivided into bifacial cleavers with large cutting edges and flake cleavers made on big flakes. Bifacial cleavers are *sputniks* of Acheulean bifaces as they occur everywhere in the same context. In contrast, flake-cleavers (Tixier 1956; Tavoso 1975) appear at the end of the Lower Palaeolithic and are much more numerous and characteristic in the early Middle Palaeolithic at sites with a dominance of the Levallois technique and only isolated bifaces.

Bifaces

As a result of recent work, first of all in northern France (Tuffreau and Antoine, this volume) and southern England (Roberts, Gamble and Bridgland, this volume) the classification and subdivision of bifaces lost much of its charm,

as these studies demonstrate that there are no recognizable typological trends in time. Especially the traditional view concerning the evolution from roughly worked early bifaces to more evolved ovates and elongated bifaces can not be supported by the evidence from the European Lower Palaeolithic.

Typological variability of bifaces could be determined by function; it is, for instance, difficult to imagine that the elongated bifaces with alternately shaped (zig-zag-like) edges served the same purpose as the English "twisted ovates".

Inventory Types

In the European Lower Palaeolithic there are first of all two inventory types: Type A assemblages contain flakes, retouched flakes, and pebble tools, Type B assemblages have comparable artefacts, but in addition they contain bifaces and cleavers.

A first group of Type A-sites is represented by Dmanisi and possibly Orce, older than 1,5 Myr BP and thus older than the first bifaces (cf. Bosinski 1995). The flakes, retouched flakes and pebble tools from these sites show no major differences from the African Oldowan sites and could be classified as "Oldowan". The second, much more important, cluster of Type A-sites (such as Vertesöllös, Petralona, Gajdan, Isernia and Bilzingsleben) dates to the Middle Pleistocene and is contemporary with the Acheulean. These sites are not limited to a specific time-span but date from various Middle Pleistocene periods, including the late Lower Palaeolithic (Bilzingsleben). Their geographical distribution covers the whole of inhabitated Europe, including its southern and western parts where Acheulean assemblages also occur. It is a situation comparable to the East African one, with comparable discussions and arguments (cf. Leakey 1975; Stiles 1980).

The Type B-sites contain all the Type A-artefacts as well as bifaces and cleavers, and are traditionally classified as "Acheulean". At these sites the number of bifaces and cleavers varies considerably, but it does not seem very useful to restrict the term "Acheulean" only to sites with a high percentage of bifaces (Tuffreau 1987). Contrary to the Type A-sites the Acheulean displays a specific distribution pattern, that includes the Caucasian region, the southern European peninsula and western Europe, while no Acheulean sites are known from central and eastern Europe.

The Caucasus region is linked to the African "cradle" of bifaces and cleavers by Asia Minor and the Levantine corridor. From the Caucasus region these types could have extended to southern and western Europe. For the southwest European finds, Alimen (1975) proposed a connection to North Africa over Sicily and the Strait of Gibraltar. The fact that the Middle Pleistocene faunas from both sides of the strait are not related cannot be used as an argument against contact by humans.

The character of the possible relationship between Type A and Type B has been the subject of many discussions. It is important that there are Type B-sites with only isolated bifaces and cleavers (e.g. Soleilhac, Tautavel, Lunel Viel, Aldène and Venosa-Loreto) which in the absence of these isolated pieces would completely correspond to Type A-sites. In addition the Lower Palaeolithic succession of Venosa-Notarchirico contains alternating levels with (a) many pebble tools from limestone, some bifaces of quartzite and flint, and smaller flakes from flint as well as (b) layers (Alpha E, E 1) containing first of all retouched and unretouched flakes of flint, but no bifaces (Mussi, this volume).

The examples referred to above could indicate that there was no fundamental difference between Type A and Type B sites. The presence or absence of bifaces and cleavers might depend on the kind of activities performed at a site. In this context it is striking that Lower Palaeolithic sites with many elephant bones, such as Torralba, Ambrona, Aridos, Fontana Ranuccio, La Polledrara and Kärlich-Seeufer, generally yield high percentages of bifaces and cleavers. The situation at Venosa-Notarchirico is especially indicative of this point: this site yielded a skull of a young elephant lying upside down with a disarticulated, broken mandible. The elephant's bones were surrounded by bifaces, pebble tools, and flakes. Here it seems obvious that bifaces and pebble tools served to dissect an elephant (Piperno 1992; Mussi, this volume); such a function could explain the spatial distribution of bifaces. The Aridos 1 - elephant was at least accompanied by some waste flakes of biface production (Raposo and Santonja, this volume) and only at Aridos 2 and La Polledrara the elephant bones were found without bifaces and cleavers.

note

1 This short note provides some personal comments concerning the Tautavel discussion on European Lower Palaeolithic stone industries, that was chaired by the author. The comment was updated in March 1995 (cf. Bosinski 1995).

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