DERIVING THE SIMPLE FROM THE COMPLEX - WHAT MIGHT THE EARLIEST AMERICAN ARTEFACTS LOOK LIKE ?

by R Esmée Webb

The problem of the earliest evidence for human occupation of the New World is a highly controversial topic which has gained in interest for British archaeologists since the Research Laboratory for Archaeology and the History of Art at Oxford is proposing, once its accelerator becomes operational, to date some of the early American sites about which there is considerable discussion. Dating material from these sites is contentious, either because they are considered to be too old for conventional radiocarbon counting techniques, or because obtainable samples are too small for even the high precision small counters, such as at Seattle or Harwell, to provide finite dates. Whether or not this project will produce satisfactory results remains to be seen given the high error terms expected on dates older than 30,000BP.

I first became interested in the controversy when it was suggested that the first settlement of Australia and the Americas should be included in Year 1 of the Diploma in Archaeology of the University of London, which I teach. Even a cursory glance at the general literature (Griffin 1976; Jennings and Norbeck 1964; MacNeish 1973; Wormington 1957) quickly revealed that there are two opposing views among North American researchers. Each view now has firmly entrenched proponents and debate between the two camps is vehement and acrimonious (Browman 1980; Bryan 1978, 1981; Carter 1980; Ericson et al 1982; Shutler 1982). Traditionally the earliest acceptable artefacts are the sophisticated Llano assemblages comprising pressure-flaked projectile points and some retouched flake tools, mainly scrapers and drills, for which antecedents can be found in the eastern Siberian upper palaeolithic. More controversially, claims for a great antiquity, possibly dating back to the Middle Pleistocene, are made for certain apparently 'primitive' collections of stone pieces, on analogy with apparently similar Eurasian lower and middle palaeolithic material.

Much of the controversy hinges on the question whether these 'primitive' assemblages for which an early date is claimed are really humanly-made tools, or the fortuitous product of natural flaking. An Old World archaeologist, trained in the recognition and analysis of stone tools in a variety of raw materials, might be able to make a significant contribution towards resolving this controversy. This is particularly true as some of the American protagonists in this debate lack sufficient expertise to make any distinction between artefacts and geofacts, while those American archaeologists trained in Old World lithic analysis do not wish to become involved in the debate. Moreover, my own non-involvement in the petrified attitudes which have been adopted in America could bring a welcome objectivity of approach to an embattled situation. Certainly during my field work I have been well-received by members of both camps and able to study any collection I wished to see. To date I have seen most of the collections from both the eastern and western parts of North America. I still need to see some of the Alaskan material and some collections from the Great Lakes area. However, I have studied sufficient material to begin to draw some conclusions.

The earliest prehistory of North America is too vast a topic to tackle here in its entirety. Instead I want merely to consider some aspects

of lithic technology and typology. However, some information on the Quaternary background is necessary to set the scene. People did not evolve separately in North America; therefore, their origins must be sought in northeast Asia. The earliest known site in that area is, of course, Zhoukoudian (Choukoutien) where simple tools, possible traces of fire, and human remains probably date back to about 400-200,000BP. Peking lies at 40°N and has a continental climate which, suggests that by the Middle Pleistocene Homo erectus was beginning to develop the technology to cope with cool, temperate, climatic conditions. Whether Homo erectus could have made the crossing to North America is unknown. However, evidence for people with a truly artic-adapted life-style only becomes available much later in the early Upper Pleistocene of eastern Siberia, in the last 100,000 years. Therefore, colonisation was presumably effected by Homo sapiens sapiens. Certainly there is no good evidence for any other physical type, although there is evidence to suggest that modern Amerinds are of very recent origin (Laughlin and Harper 1979; Taylor in Megaw 1977).

In North America physical geography had a crucial role to play. The land mass is without marked internal barriers to movement from north to south. The major mountain systems trend southwards down the western seaboard. Interior America is an area of relatively low relief whose major river sytems also trend southwards. Even the eastern mountain systems follow this southerly trend. Therefore, Palaeo-Indian people coming from far eastern Asia would have found movement within North America fairly unrestricted. The early European settlers experienced difficulties because they were trying to move westwards across the physiographic grain, especially when attempting to cross the Rocky Mountains.

The actual pattern of movement into North America is unknown. It is assumed that people arrived from far eastern Asia across the Bering Straits some time during, or immediately after, the last glacial maximum of 22-15,000BP, when lowered sea level would have exposed the vast Beringian land area which served as a faunal bridge throughout the Pleistocene. Recent geological work suggests Beringia was also exposed at 75-50,000BP and again at 42-35,000BP (Hopkins et al 1982). The Alaska-Yukon area seems to have been largely ice-free during glacial episodes with a herb-tundra or grassland vegetation capable of supporting sufficient animals to serve as a refugium for humans as well (Hopkins et al 1982; West 1981). Human movement from Alaska into the mainland United States was undoubtedly influenced to a large extent by the presence of the Wisconsin glacier which comprised two major ice masses. Alpine glaciers built up over the Rocky Mountains to form the Cordilleran ice sheet which possibly calved into the Pacific to the west and fingered out onto the northern High Plains in Canada. The Laurentide ice sheet built slowly and massively out from the Hudson Bay across the Canadian shield, reaching south to the Great Lakes and in the west possibly coalescing with the Cordilleran glaciers during the glacial maximum. The presence or absence of an ice-free corridor east of the Rocky Mountains at 22-15,000BP is another controversial topic (AMQUA 1978). To presuppose movement down an ice-free corridor as a means of ingress predicates human entry into the mainland United States either in the last interglacial or in the early or late Wisconsin. Whether or not such a corridor existed, environmental conditions within it would have been unpleasant and probably only marginally capable of sustaining animal or human life until well into the late glacial.

The alternative route along the coast proposed by Fladmark (in Bryan

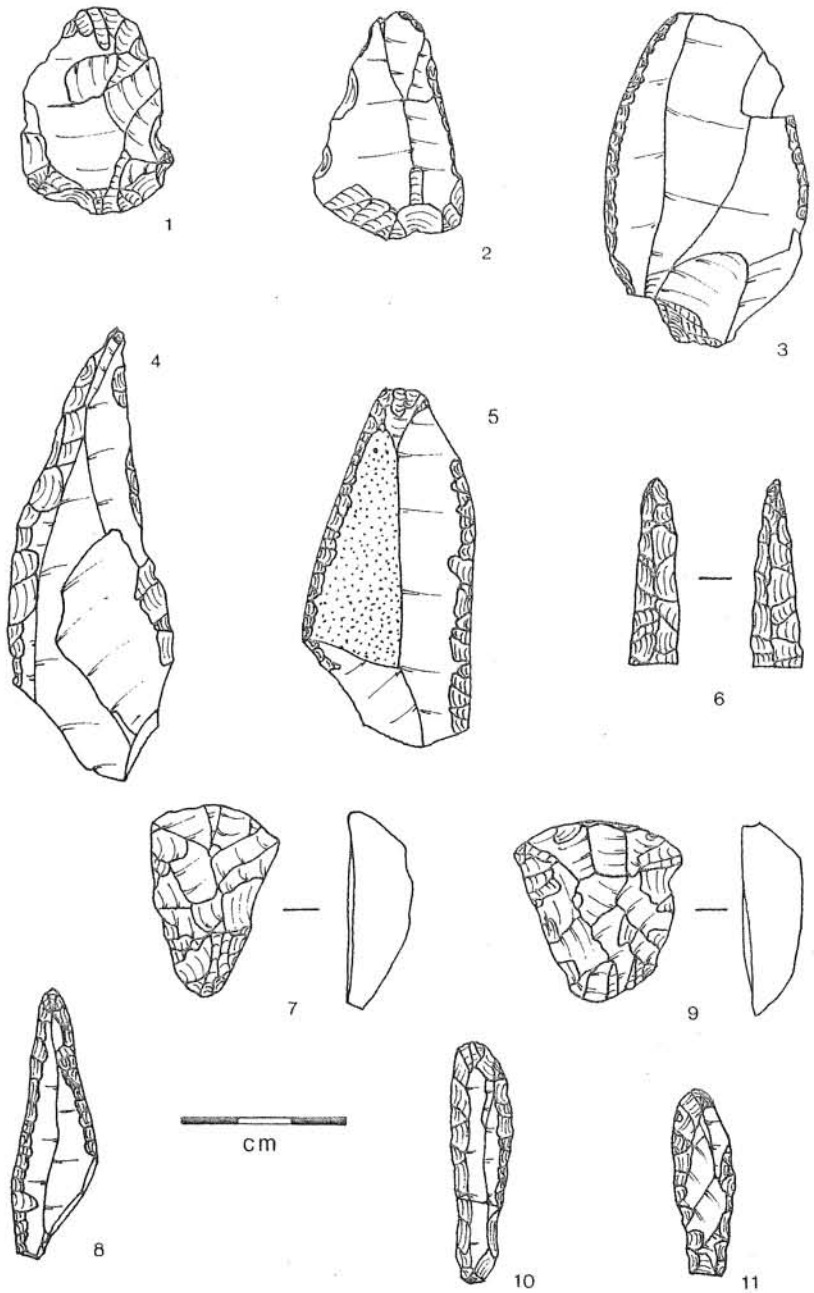
1978) has the advantage that it is not time-dependent. It presupposes people with a fairly sophisticated marine oriented technology. However, there is now plenty of evidence from Australasia (Mulvaney 1975; White and O'Connell 1982) which strongly suggests the presence of boats, or at least rafts, in the Pacific by about 100,000BP. Moreover, while the earliest evidence of human settlement in the Japanese archipelago is regrettably not entirely satisfactory (Ikawa-Smith 1978), those islands appear to have been settled more recently than 50,000BP, when boats would have been essential. Finally, a boat-borne colonisation is the neatest way to explain the littoral distribution of known early sites in South America, which are as early as, if not earlier than, Palaeo-Indian sites in the North. No sites, clearly older than 15,000BP have yet been found along the western seaboard of North America, but that is not surprising given the effects of post-glacial eustatic sea-level rise. Moreover, it is unlikely that such sites will ever be found, should they exist, for there is little or no continental shelf on this seaboard due to the subducting eastern Pacific plate.

In summary then, entry into North America by land was certainly possible by about 75,000BP and by boat from about 100-50,000BP. Therefore, if people did arrive then, there should be evidence for a pre-Llano technology probably analogous to the eastern Asian middle and early upper palaeolithic.

My objective has been to study the authenticity of the 'primitive' collections claimed to belong in this time slot and to compare them with the classic Palaeo-Indian assemblages, particularly the earlier Clovis material. I presumed that authentic earlier assemblages might be expected to show some technological similarities either with Old World middle palaeolithic assemblages or with the later Llano material, particularly in details of flake production and retouch, or with both.

The Llano complex is divided into two facies. Sites belonging to the later, Folsom, facies have been found only in the southwest United States and date to about 11-9000BP. The tool kit comprises basally-fluted, leaf-shaped, pressure-flaked, projectile points frequently made on heat-treated stone. The flake tool component clearly derives from the Clovis facies and includes some larger, surprisingly crude pieces. Sites attributed to the earlier, Clovis, facies have been found all over the continental United States, including the northeast (Newman and Salwen 1977), and date to about 12-10,500BP. The tool kit comprises larger projectile points, often retouched by soft hammer direct percussion, usually not basally thinned or heat treated. The flake tool component comprises simple edge-retouched pieces including knives, piercers, and simple, thumbnail and fan-shaped scrapers (Fig. 1). There is usually a rather cruder component including biface preforms. Overall there is great similarity in the edge-retouched flake tool component of both facies of the Llano tradition. American research has concentrated on the projectile points which show considerable morphological variation both in time and space with many types and sub-types being recognised. However, they clearly represent a high input of technological energy coupled with low cost-effectiveness. It requires not

Fig. 1 (on facing page).
CLOVIS TRADITION RETOUCHED FLAKE TOOLS: 1-3 scrapers from Murray Springs, Arizona; 4 scraper from Lubbock Lake, Texas; 5 scraper from Domebo, Oklahoma; 6 drill from Meadowcroft, Pennsylvania; 7-8 scrapers from Shoop, Pennsylvania; 9-11 scrapers from Vail, Maine.



only considerable time and skill to produce even a Clovis point, but a casual inspection of any assemblage shows a high percentage of broken points. Some of them clearly broke on impact in use but others, no doubt to the fury of the knapper, broke in manufacture, usually during final thinning. The possibility that projectile points represent a high-energy speciality grafted onto a simple, retouched flake tool technology, with the discovery that heating certain stones increased their tractability, has recently been revived (Humphrey and Stanford 1979).

I, therefore, decided to concentrate on the flake tool component which might conceivably have middle palaeolithic antecedents, and to study as much of the controversial early material as possible. My basic hypothesis was that if a pre-Llano technology existed it would comprise simple edge-retouched flake tools, plus perhaps a biface component, and would be as recognisably of mode 3 type as are the early Australian horse-hoof core tool and scraper assemblages. This is not so. There are two main categories of potentially early artefacts: worked bone and crude stone. Neither is convincing for the reasons outlined below.

An early date has been claimed for broken bones found in the Yukon and elsewhere (Humphrey and Stanford 1979). I have studied the collections in Toronto, Ottawa and the Smithsonian Institution. None of the material I have seen can be considered incontrovertibly of human workmanship, a view with which some of the excavators now agree ! Moreover, most of these 'bone tools' have not been found in situ but redeposited by fluvial action after erosion from unconsolidated deposits. Thus their age is debatable. In the Old Crow Basin, however, a reworked C. elaphus tibia, radiocarbon dated to 28,000BP, was also found. It has been suggested that this bone might either have been worked when already in a fossil state, or had stayed green post-mortem due to its inclusion in the artic mucks. Neither view can now be substantiated since the piece was destroyed in dating. A forthcoming issue of Quaternary Research is to consider the whole problem of bone breakage by geological process under freeze/thaw conditions. Its conclusions should prove very interesting.

An early date has also been claimed for stone artefacts of lower palaeolithic aspect found widely scattered in California, and elsewhere throughout the southern United States. Much of this material was found either on the present land surface without any indication of its age, or redeposited in geological sediments which might be of early or pre-Wisconsin age. A good example would be Calico Hills (Simpson in Browman 1980). Most of this material is only susceptible to dating by typological means hence its artefactual status is of crucial importance. This is a perennial problem with unstratified, technologically simple material (Lab Prehist Musée L'Homme 1981). On examination most of this 'primitive' material is clearly non-artefactual. It comprises starch fractures, pot lids, spalls of various types, etc. However,

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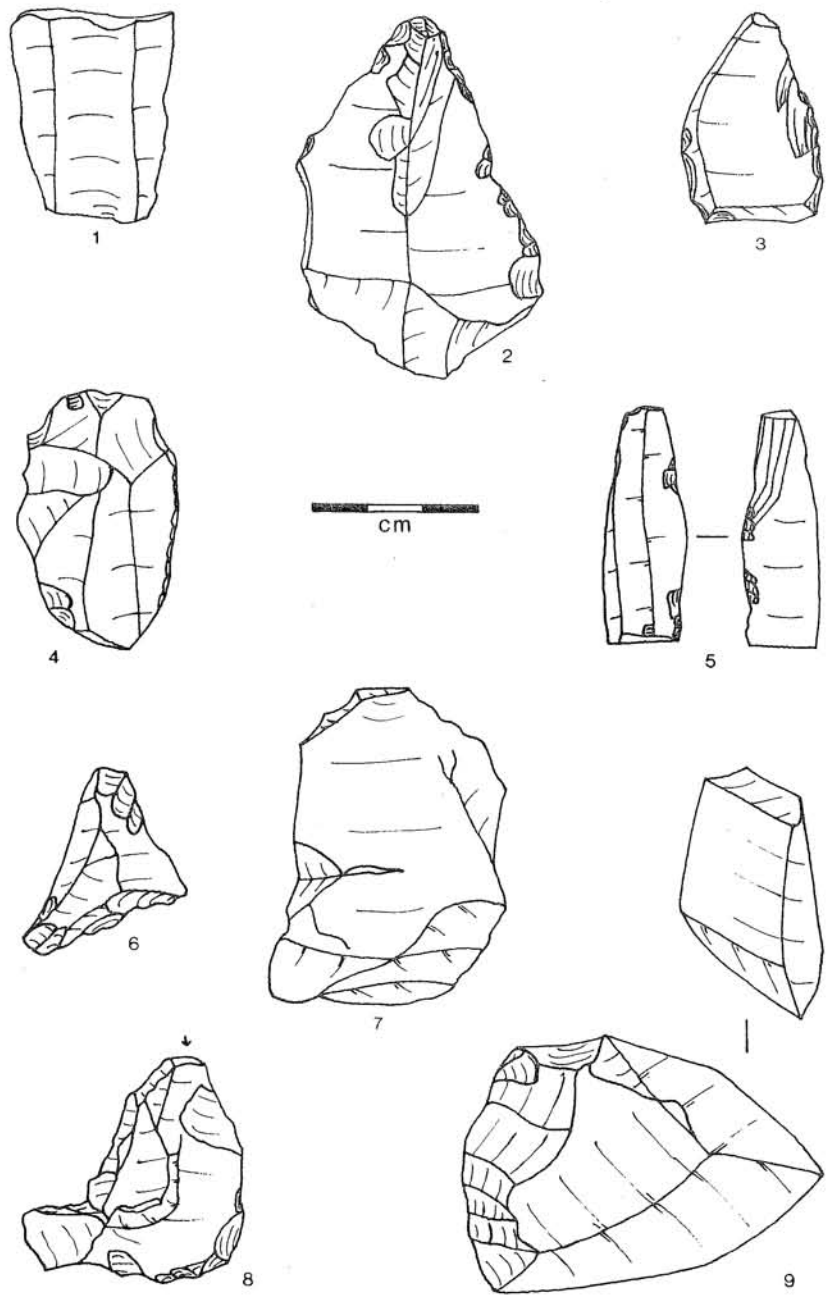
Fig. 2 (on facing page).
PRE-LLANO MATERIAL: 1-5 from Calico Hills, California, classified by the excavator as: 1 blade; 2 Mousterian point; 3-4 scrapers; 5 bipolar blade. 6-8 from Friesenhahn Cave, Texas: 6 classified by the excavator as a scraper; 7 has a possible bulb of percussion; 8 has a possible platform. 9 a large Archaic scraper in metamorphic rock, surface find from California.



none of the raw material is cryptocrystalline silicate so that it must be borne in mind that the evidence traditionally associated with human flaking would be less easy to see. A further argument for dismissing the 'American lower palaeolithic' lies in the typology of the geofacts themselves. The pieces usually comprise large cores from which often only one flake has been removed, large flakes with simple edge damage, and pieces showing crude bifacial working (Fig. 2). There is no apparent continuity with the Llano tradition which followed, nor with the technologies of eastern Asia. Moreover, there is no coherent pattern within the material itself. Material from one site cannot be usefully compared with that from another. It is hard to imagine that people able to cross the Bering Straits would so easily have forgotten the technologies their ancestors had used in Asia. Nor is it likely, since in all probability the earliest Americans were fully modern Homo sapiens sapiens with a spohisticated intelligence, that they would have been incapable of working the raw materials they found in America, even if these were less tractable.

It has been suggested that in Beringia people were forced to use bone as a raw material because there were no good stone sources available. This argument is not entirely satisfactory. While it is true that in such a permafrost environment finding good stone sources may have been difficult, if the age of the Old Crow flesher is acceptable it would imply that people might have lived in eastern Beringia for 10,000 years before being able to move overland into the mainland United States. It seems unlikely that Homo sapiens sapiens would have been unable to find in that time the stone sources exploited by later artic peoples. Until people learned to work obsidian, which was used for projectile points, especially of Folsom type, (probably due to its improved flaking qualities after heat treatment), they made use of any locally available raw material. There was no high quality flint, analogous to British Upper Cretaceous flint, available to the Palaeo-Indians. The raw materials frequently used included low quality chert, jasper, rhyolite and other fine-grained igneous and metamorphic rocks. In some parts of the United States various materials were used simultaneously for different tool types. For example, crypto/micro-crystalline materials were used for projectile points, but igneous, metamorphic, or even sometimes sedimentary rocks for flake tools. All this suggests both a dearth of good raw materials and an appreciation by the knappers of the flaking properties of the different rock types and the tools for which they were most suitable. Such a knowledge of practical geology makes some of the pre-Llano geofacts even more difficult to accept as artefacts. Supposing that this material is genuinely of late middle or early upper Pleistocene age, then early Americans showed less appreciation of simple geology than their contemporaries elsewhere. Much of this early material is made on materials either difficult to knap or with strong, natural cleavage planes. The resulting 'artefacts' are definitely inhibited by the raw material in which they were made; if they were made by other than natural processes. However, it is apparent that at approximately the same time in other parts of the world people were able to make recognisable artefacts in equally intractable raw material. The very poor quality of the pre-Llano geofacts argues against them being artefacts in my opinion. It is difficult to believe people could have moved so far into an alien environment from their Asiatic homeland with such a minimal technology; one which was, moreover, considerably cruder than that of the putative ancestral assemblages.

In conclusion, of the material I have studied that is assumed to be of pre-Llano age, I have seen little or none from geologically early

contexts which comprises convincing human artefacts. This seems to indicate that if people did enter North America prior to the last glacial maximum then they were present in very small numbers and their remains have not survived. Perhaps more Palaeo-Indian research should be devoted to identifying the pre-Wisconsin land surface which might survive in the south or southwest. However, given that in Tennessee even the Archaic is now buried under 10m of Holocene alluvium, it is always possible that any early Wisconsin human traces have been destroyed by post-Wisconsin geomorphological processes.

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NOTES

CONSIDERATIONS FOR THE ILLUSTRATION OF LARGE LITHIC ASSEMBLAGES

by Hazel Martingell

This article is the result of a recent look at the presentation of large lithic collections and their illustration for inclusion in excavation reports. With small assemblages it is common practice to illustrate most or all of the retouched pieces along with a selection of the principal waste components such as cores. In the past some of the larger collections were dealt with in the same way, but now that most publications are controlled from the beginning within set cost limits, it is unlikely that there will be either sufficient printing space available or sufficient finance for a large quantity of detailed, and time-consuming, artwork.

Selection of which pieces to illustrate is always a problem, and is inevitably something of a compromise, but the choice will relate typologically to the units and levels of analysis employed in the written report. Context is also important, and with recently excavated material it is possible to base the selection on well-stratified examples. Of course the governing factor of all illustrations will be the transmission of the maximum amount of information in the minimum amount of space, and with this in mind certain points do emerge.

1. Some pieces will require detailed, often multi-view, graphic description. Obviously the rarer tools such as discoidal knives and laurel-leaves deserve this kind of special attention, as do unusual and irregular pieces with complex technology to be conveyed (eg Fig. 1).

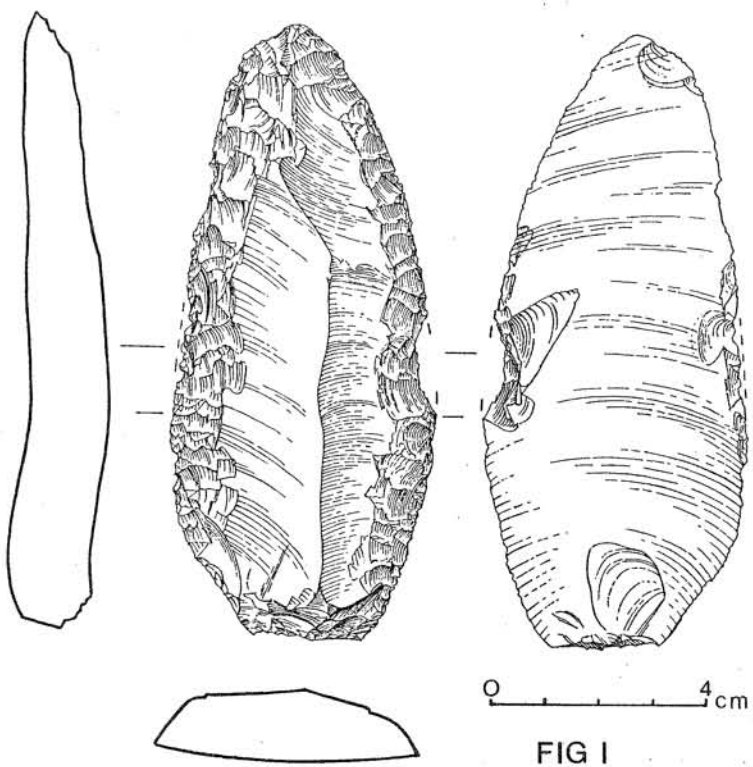

FIG I

2. More common pieces, such as flake scrapers, can be dealt with in a simpler style, using an 'open' drawing, on which negative flake scars are shown only in outline. This type of drawing will normally only involve a dorsal view, together with a section or side profile (Fig. 2).

3. As a substitute for the information lost by the absence of detail, or by the non-depiction of the ventral view or the end-on view of the platform, it is possible to use a range of conventions and symbols, coupled with an explanatory key (Figs. 2 and 3).

The symbols used in Fig. 2 were chosen initially to describe a particular assemblage for which it was necessary to depict three aspects of the platform: width, type, and the position of the bulb of percussion. The symbols in Fig. 3 are among those in current use by lithic analysts (eg Bell 1977; Green and Healey 1980; Saville 1981) to demonstrate near-microscopic attributes such as edge gloss and serration, and to convey information such as platform presence and position. The individual analyst will choose in the case of each assemblage what information must be shown, and which symbols are to be used. It is essential, however, that a key like Fig. 3 is included with each report to explain