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 (Griffin 1976; Jenness and Norbeck 1984; MacNeish 1971; Worsening 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 (Brown 1980; Bryon 1979, 1981; their 1980; Ericson et al. 1982; Shuttler 1982). Traditionally the earliest acceptable artefacts are the sophisticated lithic assemblages comprising pressure-flaked projectile points and some retouched flake tools, mainly scrapers and drills, for which artefacts can be found in the eastern Siberian upper Paleolithic. More controversially, claims for a great antiquity, possibly dating back to the Middle Paleolithic, are made for certain apparently ‘primitive’ collections of stone pieces, on analogy with apparently similar Russian lower and middle Paleolithic 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 of some of the American questions. In this debate lack of 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 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 many of both camps and able to illustrate a little what I wish 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 exist 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 400-200,000 BP. However, lies at 4000 ft above sea level and has a continental climate which suggests that 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 necessary adaptation is another matter. However, evidence for people with a truly arctic-adopted life-style only becomes available much later in the early Upper Pleistocene of eastern Siberia, in the last 100,000 years. Therefore, colonisation itself was probably facilitated by Homo sapientes. Consequently there is no good evidence for any other physical type, although there is evidence to suggest that modern Amerinds are of very recent origin (Laughin and Harper 1979; Taylor in Magg 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 along the western seaboard. Interior America is an area of relatively low relief whose major river systems 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 encountered 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 Strait some time during, or immediately after, the Last Glacial Maximum of 22-15,0000 BP, 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 72,50,000 BP and again at 42,50,000 BP. The Alaskan-Yukon area seems to have been largely ice-free during glacial episodes with a herb-bundra or grassland vegetation capable of supporting sufficient animals to serve as a refugium for humans as well (Hopkins et al. 1982; Weyt 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 extended into the Pacific to the west and fingered out over the 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 exists of the Rocky Mountains at 22-15,0000 BP is another controversial topic (Amer 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 probably only enabled the use of permafrost and of sustaining animal or human life until well into the late glacial.

The alternative route along the coast proposed by Fladmark (in Bryan
CLOVIS TRADITION RETouched FLAKE TOOLS: 1-3 scrapers from Murray Springs, Arizona; 4 scraper from Lubbock Lake, Texas; 5 scraper from Donebo, Oklahoma; 9-11 scrapers from Vaill, 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 recognizable 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,
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 arctic mucks. Neither view can now be substantiated
since the piece was destroyed in dating. A forthcoming issue of
Quaternary Research 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 palaeo-
lithic 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
movmen 1968). Most of this material is only susceptible to dating by
typological means and hence its artefactual status is of crucial import-
ance. This is a perennial problem with unstratified, technologically
simple material (Lab Frheid Musée De Rome 1967). On examination most
of this 'paleolithic' material is clearly non-artefactual. It comprises
starch fractures, pot lids, spalls of various types, etc. However,

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 paleolithic’ 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 artefacts 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 technology that 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 sophisticated intelligence, that they would have been incapable of working the raw materials they found in America, even if those 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 flaker 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 artefact producers. In any event, the need to learn to work obsidian, which was available for projectile points, especially of the Palaeo type (probably due to its improved flaking qualities after heat treatment), may have been a key-avoidance of 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 volcanic glass, quartz, rhyolite and other fine-grained igneous and metamorphic rocks. In some parts of the United States various materials were used simultaneously for different raw material types. For example, cryptocrystalline 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 different rock properties of the different raw material in which they worked. This knowledge may have been gained in other ways and sometimes contemporaneous or even later peoples working in the same environment.

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 Acheulean 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.

REFERENCES


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).

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 1961) 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...