Archaeology

Excavation of a palaeolithic plank from Japan

Paul G. Bahn

THE palaeolithic occupation of Japan has become well documented in recent years through a series of excavations that have uncovered various stone-tool industries[1,2], and finds such as the small, flat engraved pebbles, some depicting apparent 'breasts' and 'skirts', from layer IX (Initial Jomon) in the cave of Kamikuroiwa, dated to 12,165 before present (BP)[3] and, of course, well-authenticated finds of pottery dating back at least 12,000 years[4].

One of the enigmas of the period was the human innominate bone, the large bone comprising the lateral half of the pelvis, found in 1931 by Nobuo Naora in eroded cliff material at Nishiyagi, near Akashi city, central Japan. Because of its degree of fossilization, the bone was originally attributed to the Middle Pleistocene, and constituted the first discovery of a pleistocene occupation of Japan. Many scholars, however, believed it to be a modern intrusion into the Nishiyagi Formation. Unfortunately the bone was destroyed by fire in the Second World War, but recent metrical studies of replicas have resulted in conflicting theories, some attributing the bone to *Homo erectus*, others to modern *H. sapiens*. In an attempt to obtain a precise age for the bone, Hideji Harunari and Toyohiro Nishimoto of the National Museum of Japanese History led an excavation in March 1985 (ref. 5).

According to geologists, the Nishiyagi Formation comprises a valley, eroded out during the Riss glaciation and then buried during the Riss/Würm interglacial. The bone is thought to have come from a layer of alluvial gravel and sand, 3.13 m above sea level. The excavation was done a few metres away; the upper 8 m of the 12-m cliff at this point were removed mechanically and the next 2.4 m excavated by hand. Unfortunately, no more bones were found, and no stone tools; but to their great surprise the excavators uncovered a wooden board in this layer, preserved by waterlogging. The find was first announced in 1986 (ref. 6), and I was privileged to be able to examine it in the museum laboratories, through the kindness of Professor Harunari.

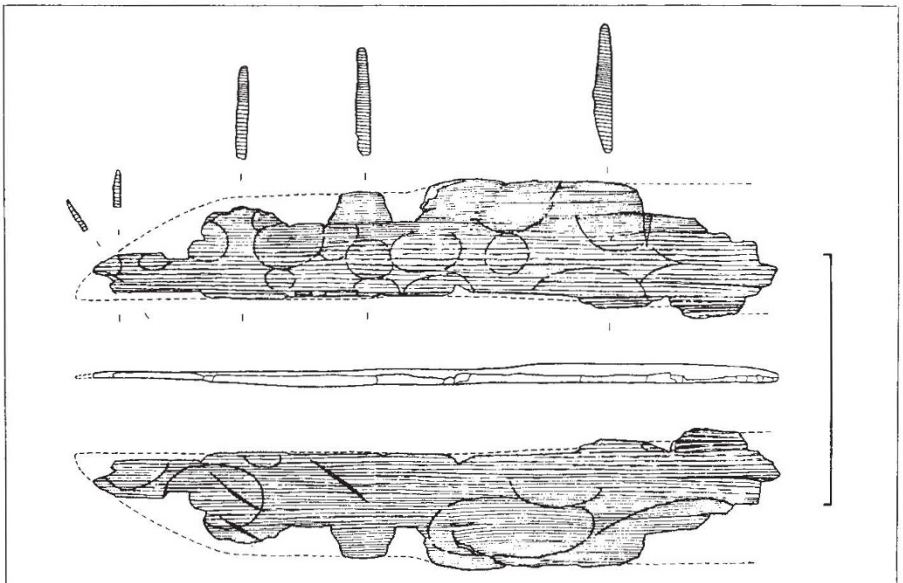
The board is thin and narrow, and has clearly been shaped, flaked and perhaps polished. The surviving fragment (26.9 cm long, up to 5 cm wide and 3–7 mm thick; see figure) is certainly artificial: it was cut across the tree rings, probably by splitting a trunk vertically with wedges, and was then whittled into shape. Both sides have clear oval indentations, like fish-scales, which indicate further shaping and working. One end, which comes to a sort of point, is thinner than the rest and this has been suggested to denote a function as a spear point or short sword, although this seems unlikely in view of the object's thinness.

The wood has been identified as a species of mulberry *(Cudrania tricuspidata)* which is extinct in Japan (except for specimens imported during the past century) but which still grows in China and Korea, and indicates a warm climate. The board was cut from a tree at least 40 years old, which may therefore have been more than 8 m in height.

The working of the board implies that the makers had considerable knowledge of this raw material, which is hardly surprising as ethnographic studies suggest that many palaeolithic stone tools were used for woodwork; this hypothesis is confirmed by microwear analyses which prove that stone tools were used for sawing and cutting wood as far back as the Lower Palaeolithic[7]; and wooden artefacts, although rarely preserved, are known from various areas and palaeolithic cultures: for example, the Clacton and Lehringen spears and Königsaue fragments in Europe[8], or the Kalambo Falls material and decorated rods from Border Cave in Africa.

How old is the Japanese board? The possibility of modern intrusion was examined but firmly excluded. Dating of the layer is imprecise, but a combination of different methods points to somewhere between 50 and 70,000 years BP. The geomorphological and palaeomagnetic estimates of the Nishiyagi Terrace are 60–80,000 BP. Radiocarbon dating of wooden fragments from the layer, using accelerator mass spectrometry, gives a very rough date of about 54,000 BP. Finally, a flake of jasper which was found in the same layer to the west, and another found further along the cliff outcrop in 1958, closely resemble tools from the Babadan sites, Miyagi Prefecture, which are dated to 50 or 60,000 BP, as well as some middle Palaeolithic tools in China and Siberia.

Japan as yet has no defined middle Palaeolithic — merely an 'early' and a 'late'. The 'early' Palaeolithic, on present evidence, spans the period from about 200,000 to about 30,000 BP, and therefore the wood must be assigned to the later part of that period. More precise dating results are expected in the near future, which may also help to elucidate the problems of whether 'Akashi man' was an archaic or a modern form of *Homo sapiens*. □



The Nishiyagi board (after ref. 5) showing both faces and as edge-on view (centre). Cross-sections (top) indicate the changing shape and thickness; parallel lines denote ring markings; circles denote flaking scars. Scale bar, 10 cm.

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Paul G. Bahn is a freelance archaeological writer at 428 Anlaby Road, Hull HU3 6QP, UK.