Kara-Bom: new investigations of a Palaeolithic site in the Gorny Altai, Russia

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New archaeological investigations at the key Palaeolithic Russian site of Kara-Bom have further characterised its stratigraphy through analysis of the rich lithic complex recovered. This evidence both complements and supplements our understanding of central and northern Asian Initial Upper Palaeolithic populations.

Lithic assemblages from the site of Kara-Bom play a pivotal role in research on the lithic technologies of the Initial and Early Upper Palaeolithic. The lithic techno-complexes of this site are considered as a reference point for the technological characteristics of the Kara-Bomian Initial Upper Palaeolithic cultural tradition of the Altai region (Derevianko *et al.* 2000). Recent studies have investigated raw material procurement and knapping technologies, and have also reconstructed the spatial and stratigraphic structure of Kara-Bom (Belousova & Rybin 2013; Slavinsky *et al.* 2016). The results of this work can be used to address questions concerning Middle to Upper Palaeolithic continuity in Northern Asia.

The Kara-Bom site was discovered in the central Altai in 1981, and was excavated over several field seasons (Figures 1 & 2). Archaeological materials were located in colluvial deposits that formed against a vertical rock wall composed of terraced ridges of metamorphosed slates (Derevianko *et al.* 1998: 5–7, 192). There are several Palaeolithic cultural horizons within the stratified part of the Kara-Bom site in excavation area 4. These comprise Middle Palaeolithic 1 and Middle Palaeolithic 2 (the Middle Palaeolithic, 62 200–72 300 BP); Upper Palaeolithic 2 (the Initial Upper Palaeolithic, 43 000 ^{14}C BP); and Upper Palaeolithic 1 (the Early Upper Palaeolithic 30 000–34 000 ^{14}C BP) (Slavinsky *et al.* 2016).

In 2016 we conducted new field research at Kara-Bom to clarify the stratigraphy of the site, to study the sequence of cultural deposits and to collect samples for dating. To achieve this, we cleaned the stratigraphic profile located on a bedrock step in the northern part of the site (Figure 2). This section was the only remaining unexcavated part of the Kara-Bom site. Investigations of the immediate area in 1991 revealed Initial Upper Palaeolithic ocherous pigment spots and personal ornaments (pendants with drilled holes) made of bone.

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Figure 1. Location of key Middle and Upper Palaeolithic sites of Gorny Altai. Map produced using National Geographic Basemap and ArcGIS Online.

The fieldwork included cleaning the deposits along the longitudinal line of the squares 'N' (2.3m in length) and along the transverse line of squares '6' (1.8m in length) (Figure 2). The thickness of the cleaned sediments along line N in the western part of the section was 0.8m, 1.4m in the central part and 0.7m in the eastern part (Figure 3). The thickness of the section along line 6 was 0.8–1.5m. Loose sediments along line N included five colluvial and aeolian layers: layer 1 comprised brownish-grey loams largely destroyed by erosion and modern soil formation (0.1–0.25m in thickness); layer 2 comprised light brown sandy loams saturated with large clastic material (0.25–0.45m in thickness); layer 3 was similar to layer 2 but was less saturated with debris (0.25–0.45m in thickness); layer 4 comprised grey and grey-brown sandy loams saturated with coarse-grained fragments of sand and gravel (0.2–0.3m in thickness); layer 5 comprised yellow-brown very sandy loam overlying the bedrock surface (0.1–0.25m in thickness). Layers 1, 2 and 4 contained cultural remains.

The studied sediments included two main concentrations of archaeological material. The upper concentration of artefacts was recorded in layers 1–2, and included one core blank, three fragmented blades without secondary modification and one flake. A rich concentration of archaeological materials was discovered in the lower part of the section, within layer 4. Here, the main cluster of artefacts was located in the area associated with a lens of burning (a hearth). The layer 4 collection includes 38 stone artefacts and 6 fragments

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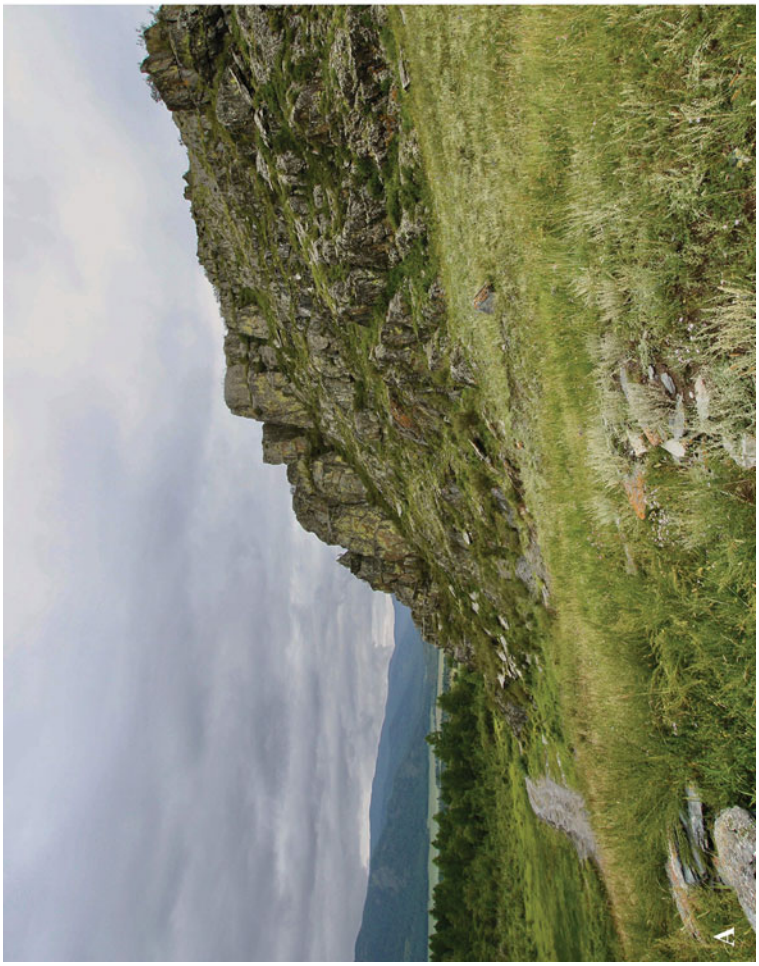

Figure 2. A) Kara-Bom, view from the east; B) plan of Kara-Bom.

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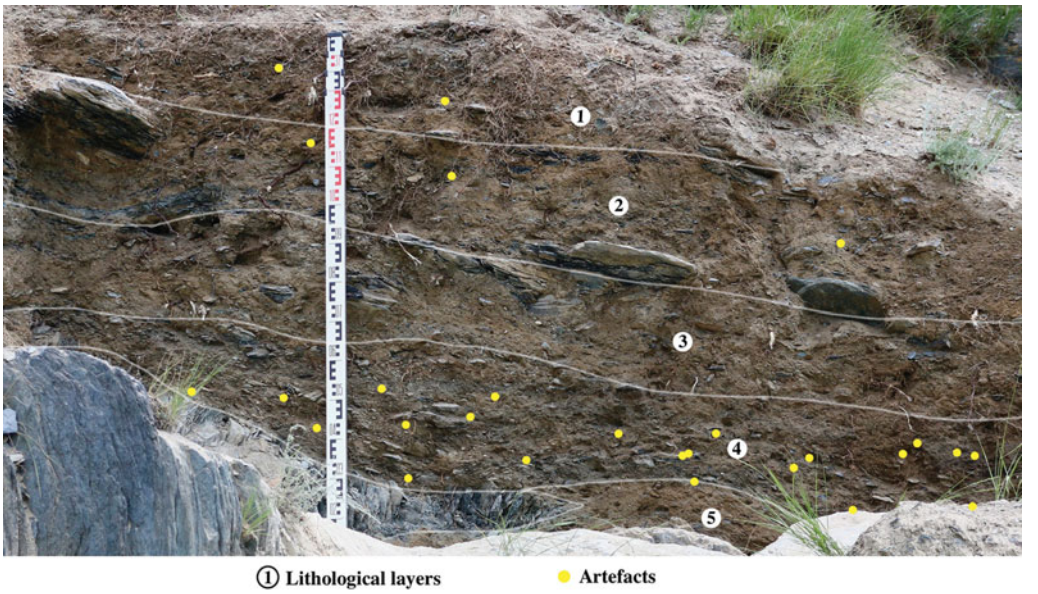

Figure 3. Kara-Bom: stratigraphic profile along the line 'N'.

of bone. The lithic industry is characterised by 1 bidirectional (or double-platform) flat-faced blade core, 3 bladelet cores (1 prismatic and 2 core-burins) (Figures 4 & 5), a series of large blades with traces of core platform preparation by picketage (Figure 6) (Slavinsky *et al.* 2017), semi-crested flakes and fragments of blade-like flakes and chips. The toolkit includes one end-scraper on blade and three retouched blades.

The technical and typological analyses and results of stratigraphic profile comparison show that the investigated deposits contain only Upper Palaeolithic assemblages. On the basis of the lithological characteristics and the archaeological assemblage, layer 4 is similar to layer 6 of the 1991 section (along line 'I'), which contains Upper Palaeolithic 2 archaeological materials. The lithic assemblage from layer 4 can therefore be identified as a typical example of the Kara-Bomian Initial Upper Palaeolithic cultural tradition. The few artefacts from layers 1–2 appear to be a part of the Upper Palaeolithic 1 horizon from excavation area 4 (layers 4–5 of the 1991 section).

The results of new investigations at the Kara-Bom site complement and expand our understanding of the dissemination of Initial Upper Palaeolithic populations in Central and Northern Asia. Contemporaneous industries have been reported from other Eurasian regions, including the Middle East, Central and Eastern Europe, the Lake Baikal area, east Kazakhstan, Mongolia, and Dzungaria and Ordos in northern China (Rybin 2014; Slavinsky *et al.* 2016, 2017). In Siberia, the earliest Initial Upper Palaeolithic industries are reported from the Gorny Altai region: at the sites of Kara-Bom, Ust-Karakol-1 (excavation area 1) and Kara-Tenesh, and also at the Maloyalomanskaya and Strashnaya Caves. The radiocarbon dates of the Initial Upper Palaeolithic layers of these Siberian sites range from 47 000–37 000 cal BP, and are recognised as some of the oldest Upper Palaeolithic strata in Northern Asia.

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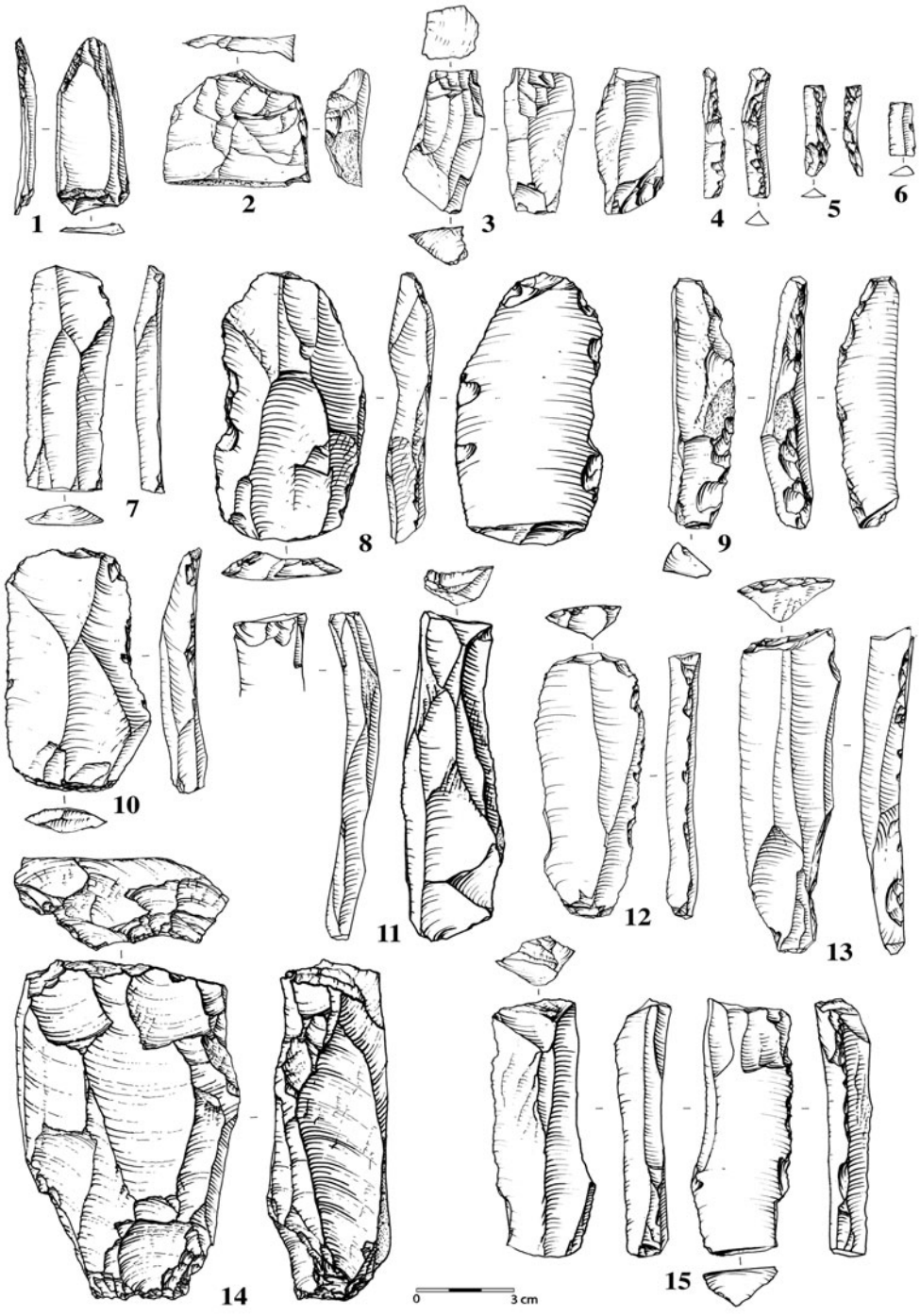

Figure 4. Stone artefacts from Kara-Bom, layer 4.

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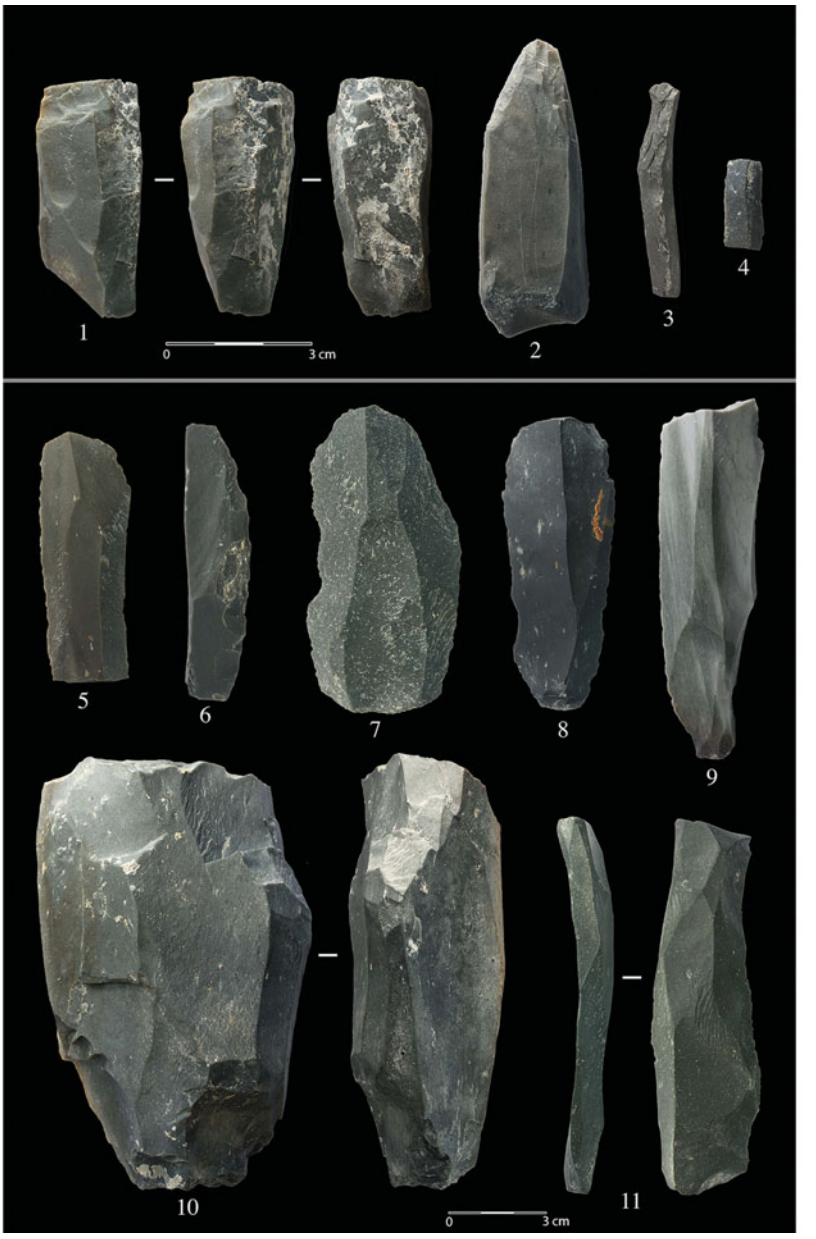

Figure 5. Stone artefacts from Kara-Bom, layer 4.

The Initial Upper Palaeolithic industries of the Gorny Altai were dominated by large blade and small spall technologies, using Upper Palaeolithic tool types and practising the manufacture of personal ornaments. New field research at the Kara-Bom site demonstrates the presence of all the main types of artefacts characteristic of the Initial Upper Palaeolithic cultural tradition: a flat-faced blade core, core-burins and prismatic cores for bladelets, and

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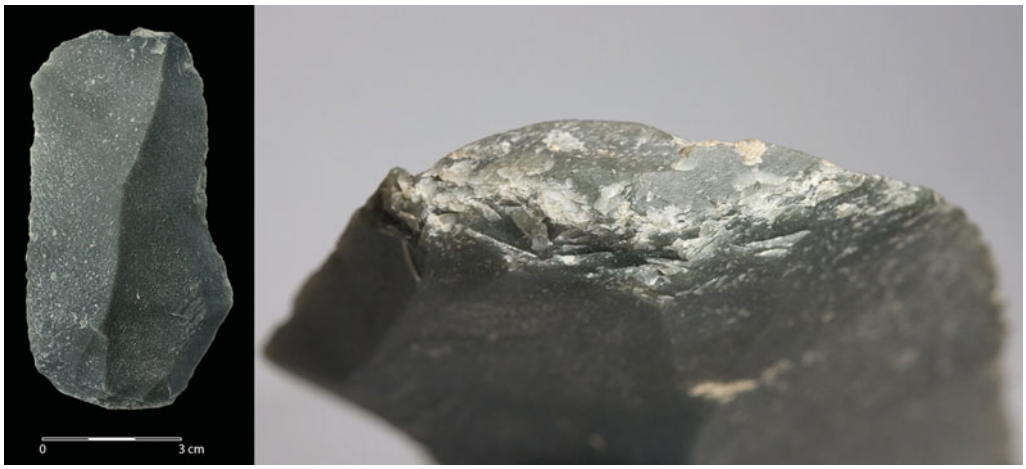

Figure 6. Traces associated with the preparation of the fracture zone on the blade from Kara-Bom, layer 4.

an end-scraper and retouched blades. It is assumed that these cultural populations spread from the Gorny Altai territories via east Kazakhstan, Dzungaria and the Gobi Altai region, to northern Mongolia and the Lake Baikal area (Rybin 2014). Future radiocarbon and optically stimulated luminescence dating will clarify the absolute date of the Kara-Bom archaeological assemblages, and will allow new insights into the development of cultural processes in Northern Asia at the dawn of the Upper Palaeolithic.

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