



AMVROSIEVKA NEW AMS DATES FOR A UNIQUE BISON KILL SITE IN THE UKRAINE

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INTRODUCTION

The site of Amvrosievka is situated near the town of the same name in the steppe country north of the Sea of Azov, about 60 km south-east of Donetsk, in south-eastern Ukraine (approx. 39° E, 47° N) (Figure 1). It is on the eastern bank of the river Kryinka, a tributary of the Mius, and consists of a "base camp" on a promontory 100 metres above the river and a "bone bed" 200 metres to the west, on the southern slope of the Kazennaya ravine which descends to the river (cf. Figure 1, KROTOVA and BELAN, 1993). The site was first discovered and excavated by V.M. Evseev in 1935, subsequent extensive work being carried out at the "bone bed" by P.I. Boriskovsky and I.G. Pidoplichko in 1940 and 1949 (EVSEEV, 1949; PIDOPLICHKO, 1953; BORISKOVSky, 1953, 1984). More recently, excavations have been conducted at this locality by A.A. Krotova, in 1978-80 and from 1986 up to the present (KROTOVA, 1986). A general description of the site was given by Krotova and Belan (1993) who also listed the three radiocarbon dates hitherto obtained for the "bone bed" by the laboratory in Leningrad. This article reports six new AMS dates for the site which have been obtained at the Radiocarbon Accelerator Unit in Oxford.

PREVIOUS INVESTIGATIONS

Before the 1980s Amvrosievka had neither a clearly defined geological stratigraphy nor any absolute dates. The majority of researchers, relying on the

proximity of the cultural layers to the surface, and also on the typology of the artefacts which included a large number of backed bladelets and points, took the view that the site belonged to the Late Upper Palaeolithic or "Magdalenian" (EFIMENKO, 1953: 315-316; BORISKOVSky, 1953: 396-398; BORISKOVSky and PRASLOV, 1964: 12) or to the last third of the Upper Palaeolithic in general (GLADKIKH, 1969: 265-266; STANKO *et al.*, 1989: 93-95). A.N. Rogachev and M.V. Anikovich, who also proceeded on the basis of artefact typology, considered the site comparable to layer 2 at Kostenki VIII (Tel'manskaya) and hypothetically dated it to the end of the Mologo-Sheksna interstadial or the beginning of the Ostashkov stadial (ed. BORISKOVSky, 1984: 178; with the correction for terminology pointed out by the editors of "From Kostenki to Clovis": 129). J.K. Kozlowski (1986) regarded Amvrosievka as Eastern Gravettian and treated it as a "type site for the steppe Pontinian zone". He lists 706 flint tools, divided into the following categories: 235 burins, 62 endscrapers, 8 combined tools, 12 truncations, 4 sidescrapers, 341 backed bladelets, and 44 retouched flakes/denticulates and notches. In addition, there were numerous unretouched blades and cores, 25 bone points, a few pieces of red ochre, and some stone or fossil crinoid pendants.

STRATIGRAPHY AND ENVIRONMENT

The "bone bed" at Amvrosievka occupies a natural gully 1.5 metres deep and 4-5 metres wide which cuts into the limestone bedrock and runs in a NE-SW direction parallel with the side of the ravine. The length of the "bone bed" is about 60 metres and its width is 8-10 metres; its thickness varies from about 1 metre in the centre of the

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gully to 20-30 cm at the edges. The recent excavations have been concentrated in two areas, a "central" area between the portions excavated in 1940 and 1949, and a "western" area further down the slope of the ravine (Figure 2). As reported by Krotova and Belan (1993:128) the stratigraphy of the "bone bed" as established by N.P. Gerasimenko in 1988-89 is as follows.

1. Holocene chernozem.
2. Light yellow loess, attributed to the "Prichernomorskii" stage.
3. Brown loam, with marl and chalk fragments, constituting the terminal stage of a fossil soil formation.
4. Neogene green-grey clay, separated from (3) by an abrupt erosional contact.
5. Chalk.

The "bone bed" occurs in unit (3); the fossil soil is identified as belonging to the "Dofinovo" stage (cf. KOZLOWSKI 1986, table 3.1).

The background to these observations is as follows. I.G. Pidoplichko first observed that the reddish-brown loam containing the majority of the bones in the "bone bed" was the result of an ancient soil formation, and this is recorded in his field notes. M.F. Veklich and Zh.N. Matviishina subsequently studied the site stratigraphy by means of two small trenches both at the "base camp" and the "bone bed" in 1980. Although these did not contain a full record of the deposits, they concluded that the cultural remains could be fitted into the unified Ukrainian scheme which they employed. They were assigned to the early or middle "Prichernomorskii" or post-Paudorf stage (VEKLICH, 1989: 10). In 1988 and 1989 N.P. Gerasimenko studied the stratigraphy by means of excavations and trial trenches which contained a fuller record of the deposits. She concluded that the great mass of the "bone bed" was in a displaced colluvial deposit of reddish-brown loam with

calcium carbonate concretions, which she identified with the late "Dofinovo" soil formation horizon of the Ukrainian scheme, corresponding approximately to the Tursac interstadial. According to her, the very lowest bones are found in the greenish Neogene clay which underlies the buried soil, and the uppermost ones are contained within light yellow loess-like colluvial loam attributed to the "Prichernomorskii" stage. She considers that the accumulation of "Dofinovo" colluvial deposits in the ravine with the already formed "bone bed" could have taken place as a result of their being washed down from the plateau at the end of the "Dofinovo" or the beginning of the "Prichernomorskii" stage (KROTOVA and BELAN, 1993:128). The boundary between these two stages is put at about 21,000 BP (VEKLICH, 1989:10).

Krotova and Belan emphasised (1993) that at certain points a 25 cm thick sterile loam layer could be seen to divide the "bone bed" into upper and lower parts, suggesting that there were at least two episodes in its formation. The fauna consists entirely of bison, identified as *Bison priscus mediator*, and it is generally recognised that the "bone bed" constitutes the remains of a seasonal kill site. There is still some argument over whether one or several hunting episodes are represented, but Krotova and Belan were on balance in favour of the latter interpretation. From 500 to 1000 individuals may have been present. Some of the bones have cut marks indicative of primary and secondary butchering, and battering indicating that the marrow was extracted, but there are no signs of fire. Krotova and Belan concluded that the faunal remains reflect not so much the hunt itself as "the utilization of the prey at a kill site".

Three C14 dates previously obtained for the "bone bed" by the laboratory in Leningrad (SVEZHENTSEV, 1993) are as follows.

LAB NO	AGE (BP)	AREA	YEAR	MATERIAL
LE-1637	15,250 ± 150	"bone bed"	1949	bone
LE-1805	20,620 ± 150	"western" area	1979	bone
LE-3403	21,500 ± 340	"central" area	1988	tooth

Krotova and Belan argued (1993) that "the first date is quite clearly too young, which is not surprising since it was obtained on bone curated in the laboratory for 30 years". The third date is "in good accord" with the date assigned to the border of the Dofinovo and Prichernomorskii horizons and "probably comes the closest to estimating the true age of the bone bed". "Amvrosievka probably dates to a time period before the advent of the last glacial maximum when the southern Russian plain featured climatic conditions suitable for such large-sized gregarious herbivores as bison". Nonetheless, they concluded, "more stratigraphic research and more radiocarbon dates are needed before

we can be secure about the age of Amvrosievka". It was for this reason that new AMS dates for the site were obtained, as reported here.

NEWLY DATED HORIZONS OF THE "BONE BED"

Six samples of bone were provided for dating from the recent excavations at the site. They come from different areas and from different (arbitrary) horizons of the "bone bed", and the results are as follows.

LAB NO	AGE (BP)	AREA:HORIZON	SQUARE	YEAR
OxA-4890	18,700 ± 240	Central: I	V	1986
OxA-4891	18,860 ± 220	Central: I	XVIa	1989
OxA-4892	18,700 ± 220	Central: II-III	XXI	1988
OxA-4893	18,620 ± 220	Western: II-III	aA	1986
OxA-4894	18,220 ± 200	Western: IV	3A	1988
OxA-4895	18,660 ± 220	Western: VI	3B	1993

As stated by the laboratory, all these dates except one (OxA-4894) are within one standard deviation of each other, despite their distinct provenances. The fact that they agree so closely argues in favour of the homogeneity of the "bone bed" and suggests that its formation was not interrupted for any length of time. Taken as a whole they are somewhat younger than the two older dates from the Leningrad laboratory. Nonetheless in my opinion they do not contradict the geological dating proposed by Gerasimenko, since in her view it is quite probable that the displacement of the "bone bed" by colluvial Dofinovo soil and then by Prichernomorskii loess deposits may have taken place already during the Prichernomorskii stage, i.e., the Late Valdai glacial maximum which is the time indicated by the Oxford dates. In my view, the difference between the average of the new dates and the two older of the dates from Leningrad is not so great as to cardinally affect my previous age determination of the site to the second third of the Upper Palaeolithic (KROTOVA, 1986: 62-64).

CONCLUSION

Amvrosievka obviously is a highly unusual and valuable site from the palaeoanthropological point of view. Precise dating is important not only in order to provide a reliable position for it within the general European sequence but also to help in determining the nature of the site. Was it used once or repeatedly for hunting operations and if the latter what was the probable time interval between those operations? It was to address this question that samples were provided from different areas and from different horizons within the "bone bed". On the basis of the new dates, the answer must still remain open for the moment, since the dates overlap and there is no consistent trend correlating age with depth. Nonetheless the general position of the site within the Late Glacial sequence of the northern Black Sea area has been convincingly demonstrated.

ACKNOWLEDGEMENTS

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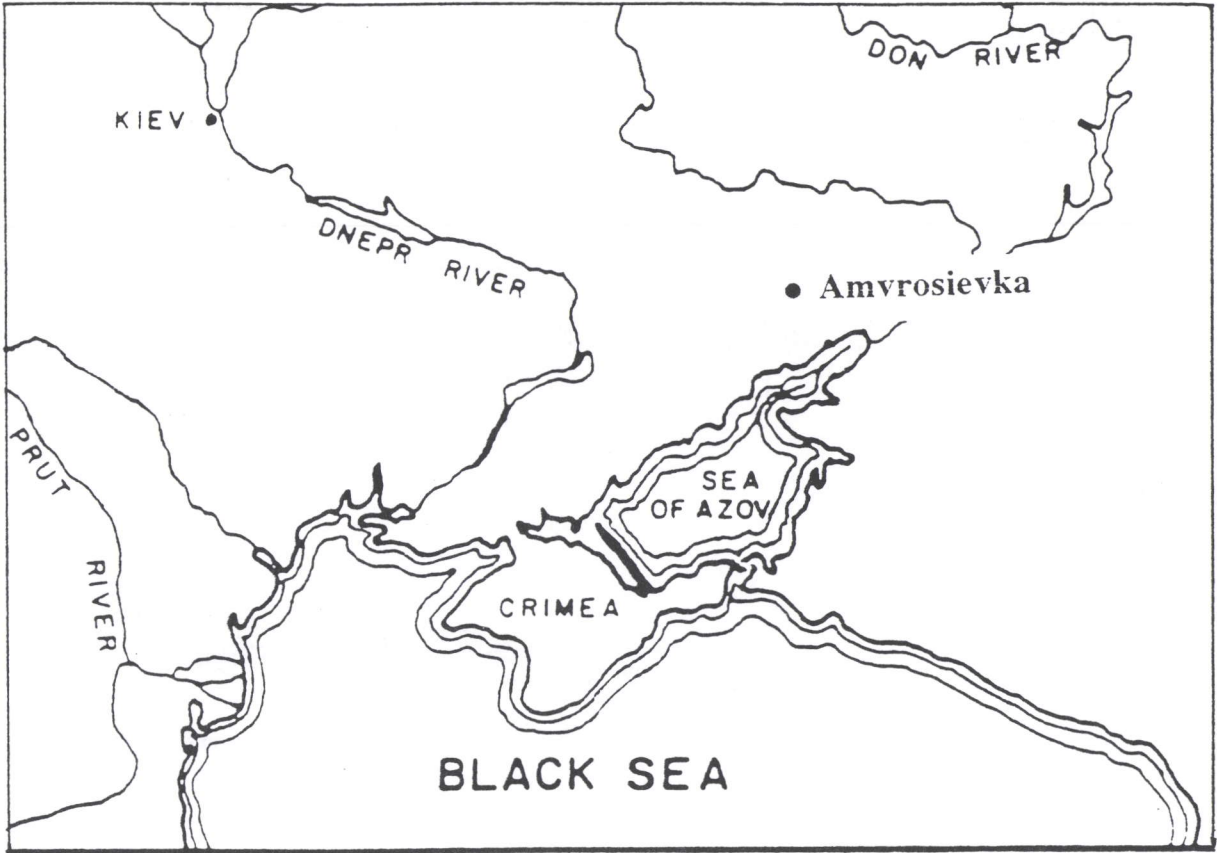
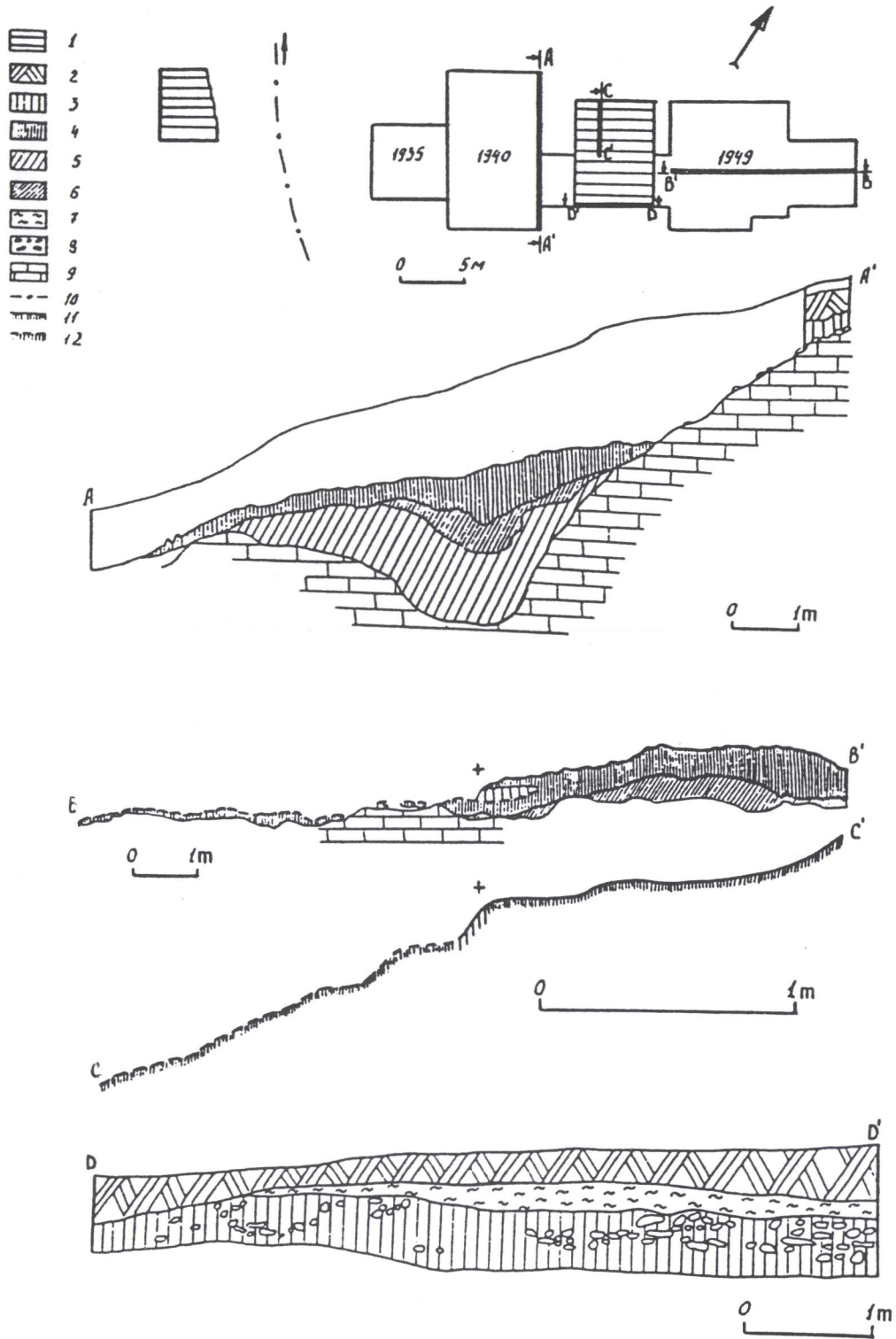


Figure 1 Amvrosievka: site situation



Bone Bed. The location of excavation units and stratigraphic profiles. A-A¹ and B-B¹, 1949 excavations; C-C¹ and D-D¹, 1986-1989 excavations. 1, 1986-1989 excavations; 2, chernozem; 3, brown loam; 4, cultural layer in brown loam; 5, green-gray clay; 6, cultural layer in green-gray clay; 7, light yellow loess; 8, marl and chalk fragments; 9, chalk; 10, talweg of the present day ravine; 11, surface of the cultural layer above the ledge; 12, surface of the cultural layer below the ledge; +, ledge.

Figure 2 Amvrosievka: Bone Bed (after Krotova and Belan, 1993)