

THREE ARCHAEOLOGICAL FIND HORIZONS FROM THE TIME OF THE NEANDERTHALS. PRELIMINARY REPORT OF THE EXCAVATIONS IN THE LAKE BASIN NEUMARK-NORD 2 (SAXONY-ANHALT, GERMANY)

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Abstract

According to the excavation data in the lake basin Neumark-Nord 2 it was possible to record three different archaeological find horizons in the superposition. The older find horizon contains numerous smashed bones and flint artefacts, characterised by the Levallois technology of the developed Middle Palaeolithic and is dated, so far, to “Intrasaalian” Interglacial. The second find horizon (NN 2/1) is situated above the NN 2/2 and is characterised by the slight dispersal of bone fragments and flint artefacts. It probably belongs to the beginning of the Eemian Interglacial. The youngest find horizon (NN 2/0) lies over the Eemian optimum and belongs to an Interstadial within the Weichselian Glacial.

Key words: Middle Elbe-Saale region, Middle Palaeolithic, Eemian Interglacial, Levallois technology, Weichselian Glacial.

Introduction

The research into the Quaternary ice age and its archaeological cultures has a long tradition in the Middle Elbe-Saale region, which goes back to the end of the 18th century. This region became an important area of Pleistocene investigations, which influenced the discovery of diverse sites of early man and his culture. Due to the long period of time since the emergence of Palaeolithic sites to their discovery, considerable changes in the landscape have taken place. Natural or anthropogenic events obliterate the intermediate evidence necessary for the reconstruction of the environmental and cultural development of our remote ancestors, so that research often includes diverse archaeological sites, different in time and space, but at the same time isolated from each other. It does not often happen to investigate one micro-region with several chronologically different sites in the restricted area. This is why the latest discoveries in the former opencast lignite mine area of Neumark-Nord in the valley of the River Geisel (Geiseltal) are a matter of great importance. The peculiar environmental situation, due to the stretching lakes at the different times, was always an attractive place, not only for diverse animal species, but also for humans. As a result of this, a unique archaeological landscape emerged, characterised by various archaeological sites with numerous find horizons. Recent research into the former lake basin Neumark-Nord 2 allows us to take a better look at the archaeological and environmental development and the geological processes taking place in the

Pleistocene in this micro-region, as well as to extend our understanding of the way of life of early man.

1. Short note on the history of the Pleistocene investigations in the Geiseltal

The Neumark-Nord former opencast lignite mine is situated ten kilometres southwest of Halle (Germany, Saxony-Anhalt) (Fig. 1) on the northeast slopes of the Geiseltal. For more than 300 years lignite was exploited, till the beginning of the Nineties of the last century, shortly after the political changes in East Germany, when the exploitation finished. Since then up to now, a comprehensive redevelopment of the opencast mine has taken place, and in the year 2009 it should be completely filled with water, creating one of the largest lake areas in central Germany (Fig. 1).

For a long time, above all since the late 19th century, lignite mining was accompanied by geological investigations. Important finds of Eocene vertebrate fauna, eg the old horse *Propalaeotherium isselanum* (Krumbiegel 1995) made the Geiseltal world-famous. Besides, Pleistocene sediments containing fossils were researched intensively too (eg Siegert, Weißermeil 1911; Lehmann 1922; Lehmann, Lehmann 1930; Ruske 1961). The centre of interest in this early period lay in the Middle to Upper Pleistocene mammal faunas and mollusc successions, rare relics of vegetation found mostly in river gravel (eg Siegert; Weißer-

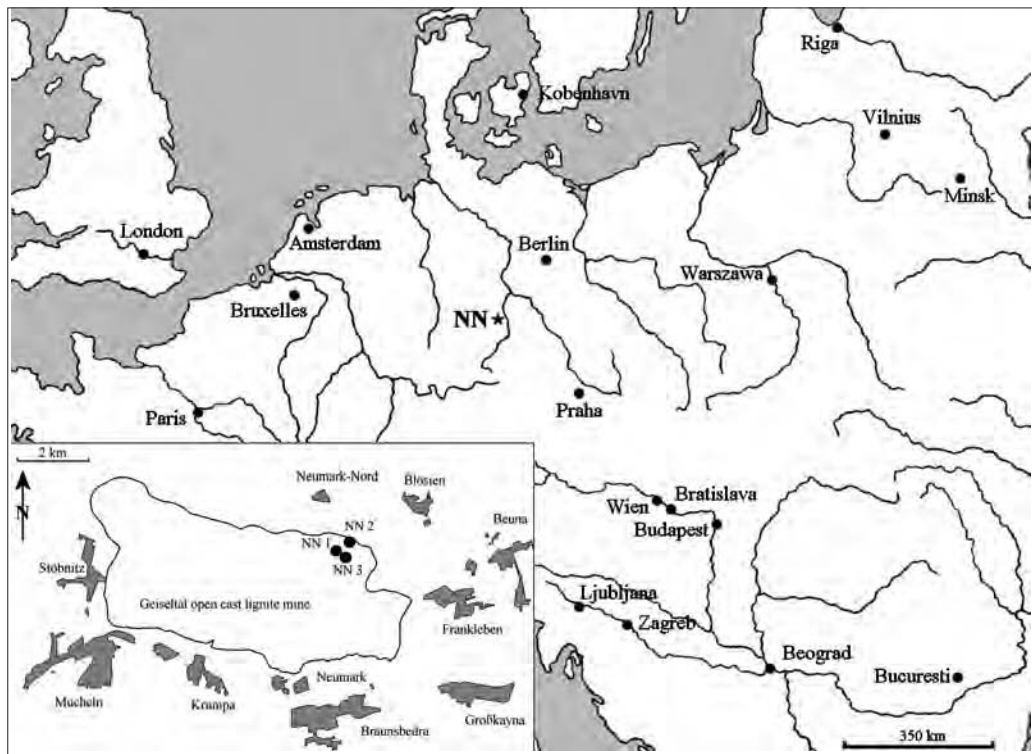


Fig. 1. The localisation of lignite mining at Neumark-Nord and Geiselatal in the near future

mel 1930; Hunger 1939; Mania, Mai 1969). In any case, all these finds had a coincidental character. The most peculiar find could be the complete *Mammuthus trogontherii* skeleton from the Pfünerhall exploitation area (Toepfer 1957), which was found in the gravel of the so-called main terrace of the early Saalian glaciation before the Drenthian stage.

In contrast with the intensive geological investigations and the numerous finds of Pleistocene fossils, archaeological research in the mining area was made much more rarely due to political reasons in the former GDR. Until the beginning of the Eighties of the last century, only one Middle Palaeolithic scraper, found in early Weichselian gravel in the Mueheln mining area (Mania 1968), and a few Lower Palaeolithic finds from gravel dated to the Holsteinian complex in the Neumark-Süd exploitation field (Mania, Mai 1969), were known.

Extensive geological and archaeological investigations in the Geiselatal, above all in the Neumark-Nord open-cast lignite mine, began in the middle of the Eighties as M. Thomae discovered an interglacial Middle Pleistocene lake basin, today called Neumark-Nord 1 (NN 1) (Mania, Thomae 1987). Since then (1986–1996), the lake basin was observed and investigated by an interdisciplinary team coordinated by D. Mania. The lake basin has a 15-metre-thick organic sediment sequence and yields two find horizons. The sediments are very rich in fossils, both faunistic, with extensive vertebrate fauna, insects and molluscs, and floristic, with a com-

plete pollen sequence and plant and tree remains. The find horizons contain Middle Palaeolithic flint inventories with thousands of artefacts on different striking places, and butchering sites of large mammals (mostly rhinos and bovinds) on the banks of the lake (Mania, Thomae 1990). Geological, palaeontological and archaeological research allowed a reconstruction of the environment and the life of the hunters of the Middle Palaeolithic, probably dated to an “Intrasaalian” interglacial (ca 200,000 years ago) (Mania 1998; Mania et al 2004).

In 1995, during geological surveys, a second lake basin (Neumark-Nord 2; NN 2) was discovered by D. Mania. This lake basin existed predominantly during the Eemian interglacial and the early Weichselian (Mania 2005). In the following years, several archaeological find-rich horizons in superposition were found and researched (see below).

A third lake basin was discovered in the same period, too, and named Neumark-Nord 3 (NN 3). This basin was formed in a period of the Holsteinian complex, approximately 350,000 years ago, and is connected with a gravel complex called Körbisdorf gravel. In these gravels are reassorted flint artefacts which indicate some of the oldest evidence of the settlement of people in Saxony-Anhalt (Laurat, Brühl, forthcoming).

All three lake basins are situated in a very small area of around one square kilometre (Fig. 1). By correlation of the different sediment successions, it is possible to get

a 350,000-year-long terrestrial geological and climatic record. They allow us to take a deeper view into the cultural development of early man.

2. The discovery of the Neumark-Nord 2 lake basin and its find horizons

The Neumark-Nord 2 lake basin was discovered by D. Mania in 1995 during geological investigations. It is situated only a few hundred metres to the northeast of the lake-basin NN 1 on the slope of the opencast lignite mine. The Eemian and early Weichselian age of the lake-basin was recognised in 1997 and 1998, and an archaeological horizon was found within the early Weichselian deposits, which acquired the name Neumark-Nord 2/0 (NN 2/0).

Due to renovation work in the mining area, the find horizon NN 2/0 was endangered and threatened with destruction. A test area of 84 square metres along the slope was excavated and more than 800 finds were found, among them the smashed bones of large mammals and flint artefacts. (Mania et al 2006). From 2003 to 2004 almost 400 square metres of the former lake shore were investigated, and as a result numerous faunal remains and flint artefacts were recorded, indicating the settlement of Pleistocene hunters near the lake. The excavations were executed by the State Office of Heritage Management and Archaeology of Saxony-Anhalt.

During the installation of an exploratory trench in the spring of 2004, it was recognised that the lake basin existed not only during the Eemian and early Weichselian, but even earlier. A new find horizon containing far more flint artefacts and smashed animal bones than NN 2/0 was discovered, and called Neumark-Nord 2/2 (NN 2/2). Up to now, the above-mentioned State Office of Heritage Management and Archaeology of Saxony-Anhalt is conducting the excavations in this horizon¹. At

¹ Besides, the following scientists are taking part in the investigation of Neumark-Nord: Dietrich Mania (Jena): geology and mollusc analyses; Matthias Thomae and Stefan Wansa (the State Office of Geology and Mining in Saxony-Anhalt): geology, sedimentology; Ivo Rappsilber (the State Office of Geology and Mining in Saxony-Anhalt): geoelectrics; Frank W. Junge and Tatjana Böttcher (Leipzig University): isotopic analysis; Matthias Krbeschek (Mining Academy in Freiberg/Saxony): radioluminescence; Tim Schüler (the State Office of Archaeology in Thuringia): ESR-Dating; Stanislaw Fedorowicz (Gdansk University): TL-Dating; Daniel Richter (Max-Planck Institute in Leipzig): TL-dating of burned flint; Frank Preusser (Basel University): OSL-dating; Manfred Altermann (Office of Pedology): pedology; Konstantin Kremenetski (Moscow State University): pollen analyses; Stefan Meng (Halle): mollusc analyses; Gottfried Böhme (Humboldt

University, Berlin): vertebrates; Wolf-Dieter Heinrich (Humboldt University, Berlin): small mammals; Reiner Fuhrmann (Leipzig): ostrakode; Jan van der Made (Madrid National Museum): large mammals; Angelika Hülle and Lutz Müller (State Museum in Dessau) (preparation of lacquer profiles).

the same time, in the year 2004, a geological section of the lake sediment was made, allowing the recognition of another find horizon. The white silty limnic deposits lay between the NN 2/2 and NN 2/0 find horizons, where several bone and flint artefacts were detected. This assemblage was called NN 2/1, although so far no archaeological excavations have taken place.

In the year 2006, the research in this lake basin took on a new dimension. Apart from the State Office of Heritage Management and Archaeology of Saxony-Anhalt, the RGZM (Römisch-Germanisches Zentralmuseum) and Leiden University (the Netherlands) joined the investigation of the lake basin NN 2. However, the research of find horizon NN 2/2 in the next few years has the main priority, as due to the redevelopment works in the mining area, the site is to be flooded by the future lake.

3. The late Middle and early Upper Pleistocene lake basin Neumark-Nord 2

3.1. Geological situation

The origin of the emergence of the lake basins in the Geiseltal is dependent on the mollisol diapirismus (Thomae 2003). The autoplacial-gravitational adjustment movements in the periglacial periods opened the depositional environment for the interglacial layers (Thomae, Rappsilber 2006). Thus the Neumark-Nord 2 lake basin is the youngest one. The dimensions and structure of it were reconstructed by geoelectrical sounding (Fig. 2) (Rappsilber 2004; Thomae, Rappsilber 2006). The largest extent from north to south amounts to 200 metres. It was not possible to determine the largest extent from west to east, since the eastern and western parts of the lake basin were cleared away and demolished by the activities of the operating opencast mine.

During the latest investigations, a geological section was made, which allowed an analysis of the development of this lake basin. The sediment succession is six to eight metres thick and consists of 13 stratacomplexes (Fig. 3).

Stratacomplex 0: A sandy-gravelly glacial till of Drenthe ground moraine.

University, Berlin): vertebrates; Wolf-Dieter Heinrich (Humboldt University, Berlin): small mammals; Reiner Fuhrmann (Leipzig): ostrakode; Jan van der Made (Madrid National Museum): large mammals; Angelika Hülle and Lutz Müller (State Museum in Dessau) (preparation of lacquer profiles).

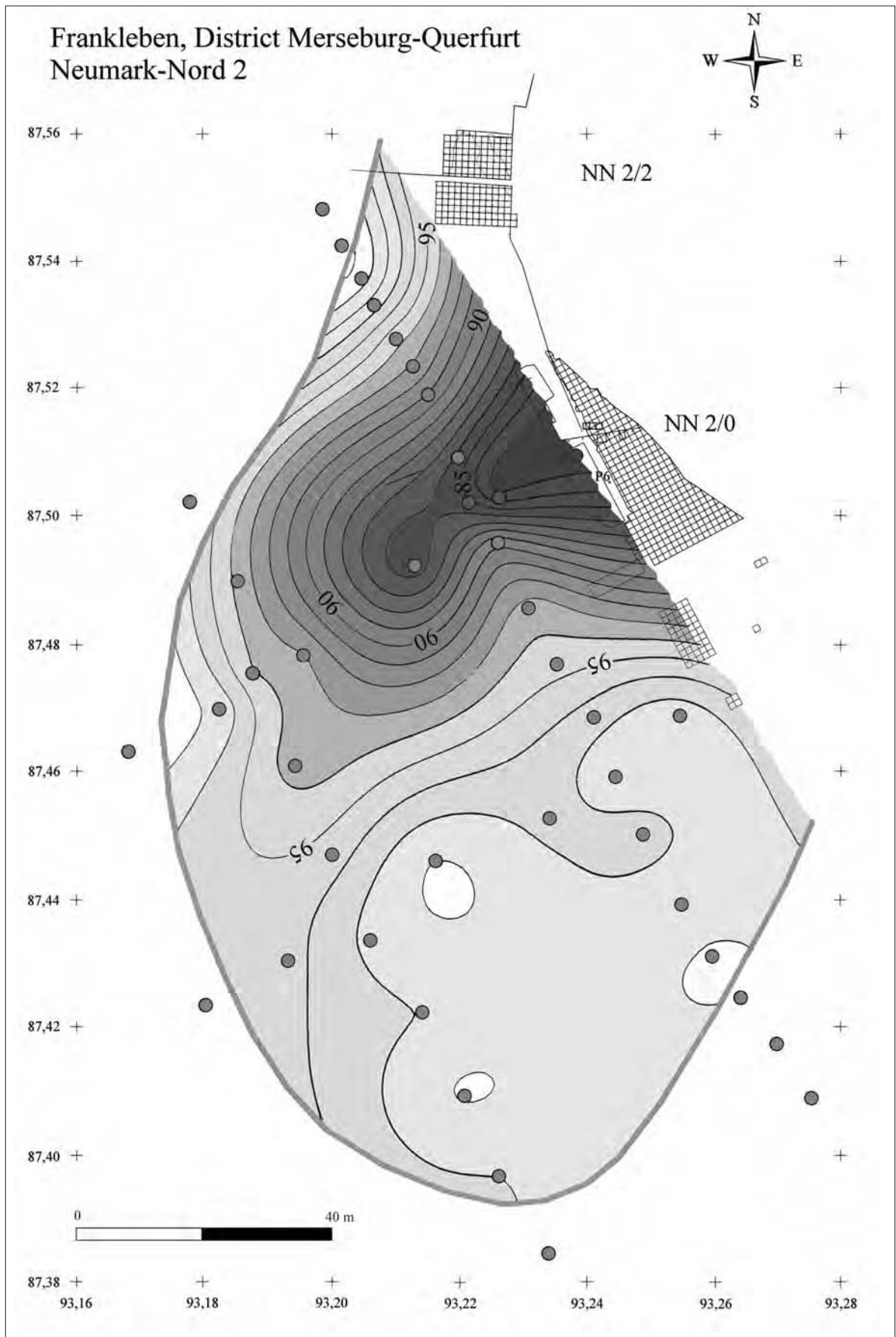


Fig. 2. The structure of the NN 2 lake basin according to geoelectrical sounding (Rappsilber 2004) and the excavation areas of NN 2/2 and NN 2/0. The grey circles are geoelectric measurement points; the black lines mark relief lines with the altitude above sea level

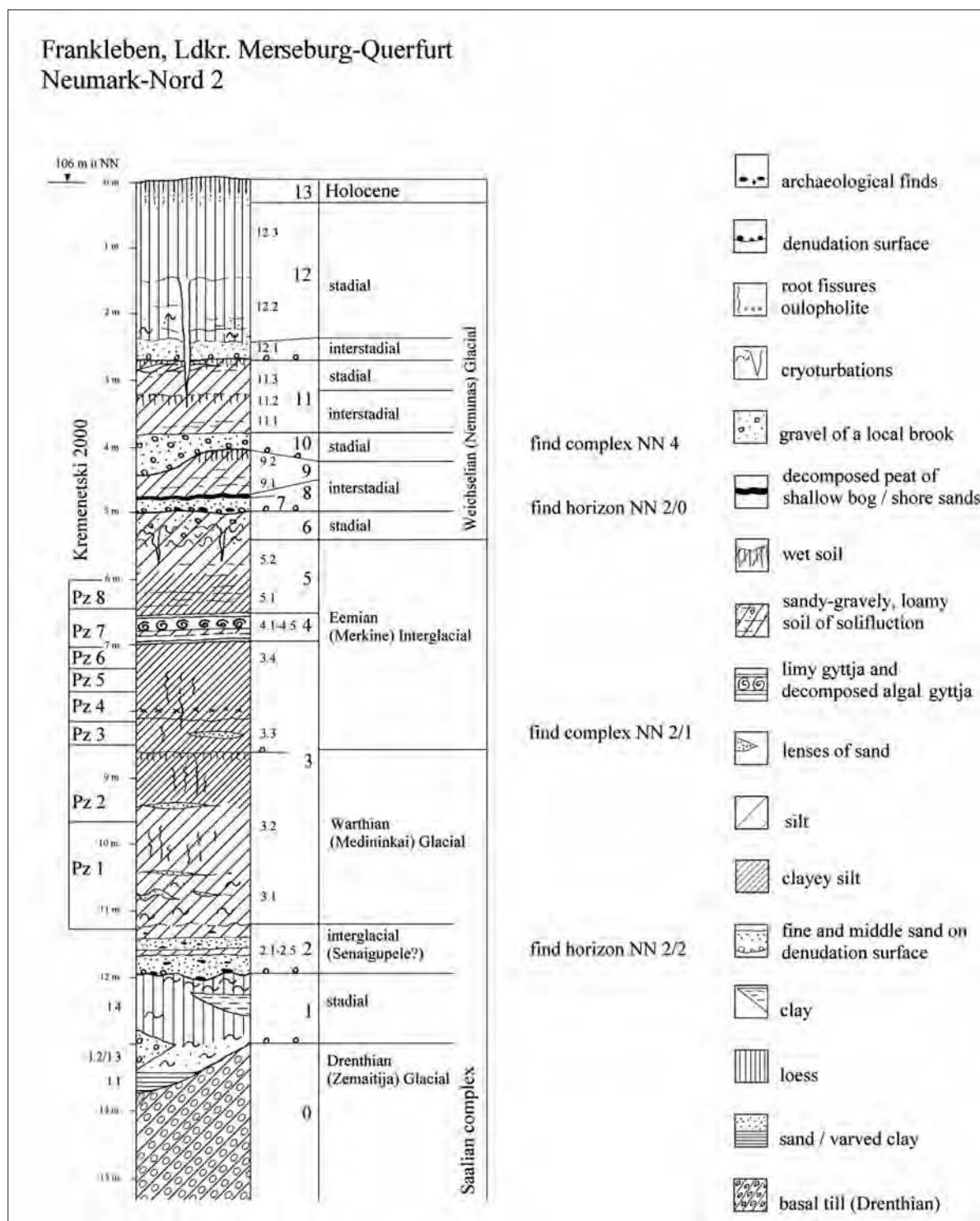


Fig. 3. A geological section of the NN 2 lake basin and the correlation with the pollen succession

Stratacomplex 1: 50 to 150cm; a basal thin varved clay (1.1), glaciofluvial sands (1.2), sandy flowing soil with redeposited material from the ground moraine and the lignite diapir (1.3) and fluvial rebedded loess (1.4), which is superimposed by the denudation surface.

Stratacomplex 2: 20 to 80cm; white and grey sands and silts; archaeological find horizon Neumark-Nord 2/2.

Stratacomplex 3: 400cm; brownish sandy silty limnic deposits, whose basal parts (3.1) show flow structures; in higher parts more clayey (3.2–3.3); a grey fine sandy silt layer is embedded over a wet soil (3.3); most upper parts (150cm, 3.4) with plaster rosettes; strata 3.2 to 3.4 contain artefacts and bones of the find complex NN 2/1.

Stratacomplex 4: Consists of black-spotted clay approx. 10cm thick (4.1) and gyttja sediments: the lower algal gyttja, 5 to 10cm thick (4.2); dark grey, partly clayey gyttja, 3 to 5cm thick (4.3); white to bright grey limy gyttja, 5 to 10 cm thick (4.4), contains numerous strongly pressed and damaged remains of fishes; algal gyttja, 2 to 3cm thick (4.5), both in colour and composition identical to the lower algal gyttja.

Stratacomplex 5: 100cm; brownish silts (5.1), very similar in their development to the lower silty limnic deposits (Stratacomplex 3); upper parts are weathered (5.2); the lower part yields also artefacts and bones of the NN 2/1 find complex.

Stratacomplex 6: 50 to 100cm; yellow-brown to reddish-brown weathered solifluction horizon, consisting of loamy, fine to coarse sand silts and superimposed by cryoturbations. Ice wedges extend from it as far as 1m in depth into the subjacent bed.

The occurrence of solifluction combined with ice wedges marks the end of the interglacial and the beginning of the glacial sedimentation succession.

Stratacomplex 7: 5 to 20cm. The denudation surface forms the basis and represents the former surface, whereupon lie fine to middle fraction quartz sands, locally interspersed by coarse sand lenses. Fine gravel rubble occurs very rarely. The denudation surface and sand layer form the find horizon NN 2/0. The light yellow-coloured sand becomes upward finer, and finally goes over to 2 to 5cm thick silts with fine sand components. This one is light-grey coloured and is the remains of the weathered silty mud.

Stratacomplex 8: 5cm; black, strongly decomposed peat, which goes back to a shallow bog.

Stratacomplex 9: 10 to 40cm; a dark-brown clayey silty mud, upward light-grey-brown silts. Cryoturbations appear in the upper part. The last three strata form the littoral limnic succession.

Stratacomplex 10: 10 to 50cm; fine to middle gravelly valley train (discordant overlays Stratacomplex 9), rich in local and northern components (predominantly quartz, flint, also crystalline, bunter, sometimes limestone). It is a matter of washed-out fluvial material and assorted Tertiary quartz gravel. The artefact collection found in the gravel was named find complex NN 4. The real thickness of the gravel is not possible to determine, as earlier it was cut by the activities of the opencast mine.

Stratacomplex 11: 150cm; silty sediments (11.1, 11.3), in the middle part of it is a weak wet soil (11.2);

Stratacomplex 12: 300cm; Weichselian flowing loess on denudation surface, upper part (150cm) aeolian loess.

Stratacomplex 13: Holocene soil formation.

3.2. Chronological aspects

3.2.1. Sedimentological, palynological and malacological view

For a chronological determination of the lake basin NN 2 the subjacent Saalian² basal till and the covering Weichselian loess are important. They give the lake basin a late Middle to Upper Pleistocene age. Investigations on the erratic pebbles of the till indicate that the till represents the Saalian 1 till of the Zeitz stage, which covers the Drenthian till (Wansa 2005).

Much more detailed is palaeontological research. According to pollen analysis (Kremenetski 2000), the middle and upper section of the Stratacomplex 3, Stratacomplex 4 and lower part of Stratacomplex 5 belong to the Eemian (OIS 5e). The pollen succession begins with the cold climatic conditions (PZ 1, 2) (Fig. 4), as PZ 3 represents the pine-birch period (PZ 3), indicating the beginning of the Eemian succession. It is followed by the mixed forest landscape (PZ 4), which later on goes over to the hazel maximum (PZ 4) and the hazel-spruce-hornbeam period (PZ 5 and 6). The maximum of Eemian is presented by the period of the hornbeam-spruce-fir forests, which corresponds to PZ 7 and Stratacomplex 4, consisting of algal gyttja and limnic gyttja. The basal part of the overlaid silty limnic deposits of Stratacomplex 5 indicates the pine-spruce period, which develops to the pine-birch landscape (PZ 8). In the upper part of Stratacomplex 5 pollen succession ends, since the overlaying sediments are free of evaluable pollen by strong decalcification.

Thus the Eemian pollen succession is clear. It shows that the Eemian optimum is distinct under the find horizon NN 2/0. Because there is no pollen preserved in the upper stratacomplexes, geological characteristics are necessary to date the find horizon NN 2/0. The end of the Eemian Interglacial lies in Stratacomplex 5. Between them and NN 2/0 no hiatus is detectable in the

² All geological periods in this paper are given in terms used in Central and Western Europe. For the Baltic countries, specially Lithuania, the following terms are typical: Saalian 1 (Drenthian) glaciation is comparable to the Žemaitija glacial, Warthian glacial to the Medininkai glacial and Weichselian glacial to the Nemunas glacial. The Drenthian-Warthian period or "Intrasaalian" Interglacial corresponds to the Senaigupele Interglacial and the Eemian Interglacial to the Merkinė Interglacial (see Gaigalas 2001, 2004).

the Neumark-Nord 1 basin and forms in the Neumark-Nord 2 basin the basal loess (strata 1.4) (Laurat, Brühl 2006). The doubled soil complex appears in the NN 2 basin as well. The lower soil corresponds to the Eemian succession of NN 2. The upper soil develops to the litoral limnic succession of NN 2/0 and belongs probably to the first early Weichselian Interstadial (Laurat, Brühl 2006). This correlation also says that in the silty limnic deposits which are lying between both soils in NN 1 the steppe lemming (*Lagurus lagurus*) (Heinrich 1990) was detected, typical of the early Weichselian in central Germany.

Generally, we can say lake basin NN 1 is older than NN 2. According to geological and palaeontological data, NN 1 matches possibly with the so-called “Intrasaalian” Interglacial (OIS 7). The find layer NN 2/2 can be generally classified as pre-Eemian and post-Drenthian; however, due to its stratigraphical position, it must be younger than the interglacial NN 1. Anyhow, it is too early to speak about an accurate chronological position of this find horizon, as further investigations are following. Above all, it is important to clarify the parallel between loess and silt layers (Stratacomplex 1; eg Fig. 3) under the find horizon NN 2/2 and the lower periglacial deposits of the NN1. In this case, NN 2/2 should be positioned in the Warthe-Glacial Period. If there is no synchronous development of Stratum 1 and the lower periglacial deposits of NN 1, the find horizon NN 2/2 should be older than Warthe-Glacial; at the same time the relationship with the interglacial of NN 1 (between Drenthian and Warthian Glacials) should be necessary to clarify, as the origin of the loess derives of Stratacomplex 3 lies between the Eemian sediments and find horizon NN 2/2 in lake basin NN 2, too. If the latter situation is confirmed, two warm climatic, post-Drenthian sites with traces of human activities are found in the superposition. Such results would be unique in central Germany, as well as in Central Europe.

Anyway, these are only preliminary results, while other interdisciplinary research and investigations (pollen analysis, sediment analysis, diverse dating methods) still continue, whose results could confirm the present chronology of the lake basin or even change it.

4. Find horizon NN 2/2

4.1. Sedimentation

The sedimentary formation of the lake-basin deposits was an intense and dynamic process, resulting in different lake development stages in the bank area, which led to the complex situation of the find horizon (Fig. 5, also Fig. 7). In the northern part of the excavation

area the basal part of the find horizon has an altitude of 101.50 metres above sea level and slopes constantly down to 100.5 metres in the southernmost part. A further 40 metres to the south, at the main profile section, the find horizon Neumark-Nord 2/2 was found again at an altitude of 94 metres.

In general, the find horizon consists of a light-grey silt and fine sands of fluctuating thickness and diverse sedimentological layers with less than 1% coarser components. In the southeast and middle area, the find horizon is up to 80 centimetres thick and lies directly on loess (Fig. 7). Fine, mollusc-rich sand, which is often partly only one millimetre-thick, forms the basis. These basal sands are often solidly cemented by lime. Finds of all sizes lie mostly in the sands directly over the loess, and are sometimes even pressed into it. The density is from 50 to more than 100 recorded pieces per square metre. This lowest layer was named the basis of the find layer B3 and means a former surface.

A one to 20-centimetre-thick firm grey clayey to silty layer is situated over the sands, representing B3. The find density here is also very high (50 to 300 items per square metre) (eg Fig. 6). Silt of B3 changes continuously upwards into a white, silty-fine sand layer, which is five to 25 centimetres thick and forms find layers B2 and B1. Here there is a clear decrease of the find density (20 to 80 items/m²) with a reduction of the find size. Between these two upper layers are slim, dark grey to grey-brown, not everywhere preserved, silty limnic deposits, which contain no finds. The find layer B1 possesses only loosely spread finds, usually of a small size. The overlaying silty limnic deposits (find layer A), which show numerous flow structures and cryoturbations (of Weichselian origin), contain only a few finds. In this excavation area the find density is 900 to 2,300 objects per square metre, among them around 80 to 480 are 3D recorded.

The find horizon rises slightly to the west and northwest; at the same time the thickness becomes thinner, to around 20 centimetres. The find layers B1 and 2 lie one on top of the other, usually not separated by a silty limnic deposit layer. Find layer B3 is only a few centimetres thick, and runs out completely in the western and northwestern direction. The find density in this area is 300 to 800 objects per square metre, among them around 40 to 210 are 3D recorded.

The find horizon rises clearly to the north, and in the northeastern area is strongly disturbed by Weichselian Glacial Period cryoturbations (Fig. 5). The exact separation of the particular find layers is not possible anymore, only an assignment to the horizons A (silt) and B (silt-fine sand).

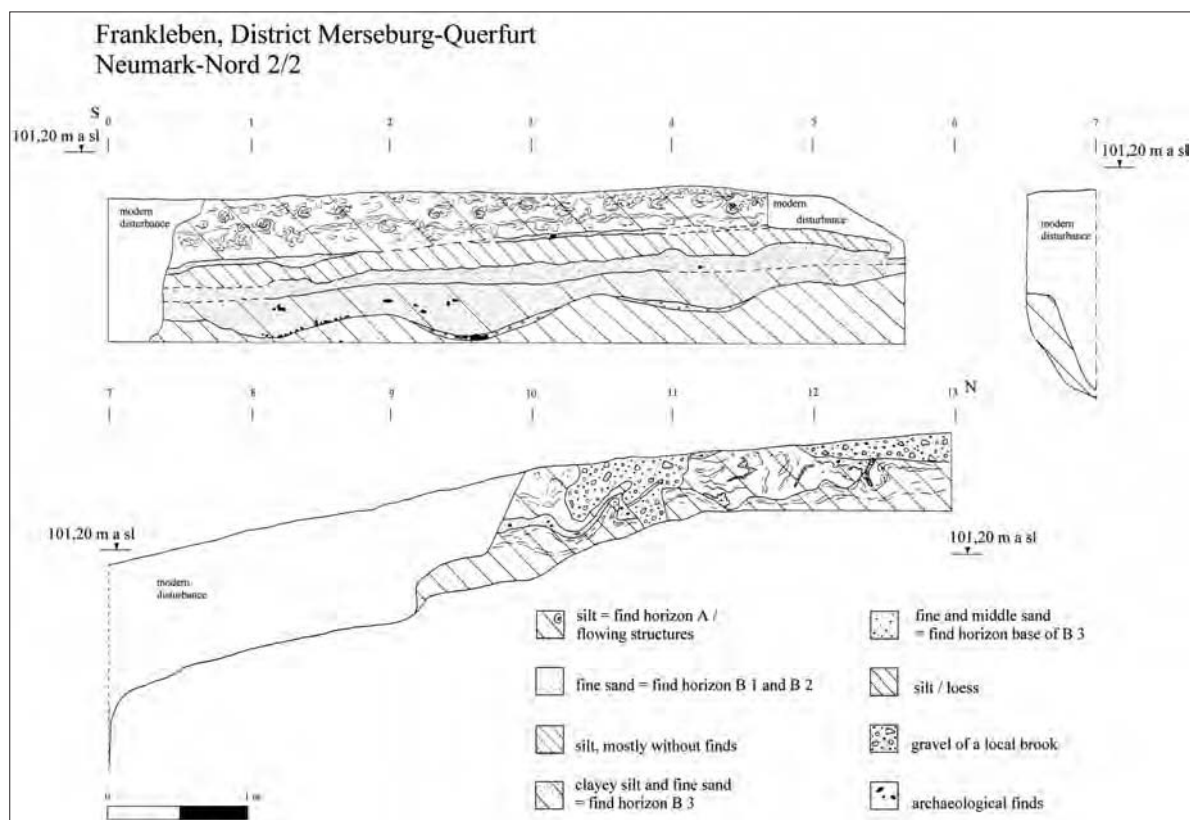


Fig. 5. NN 2/2. A profile of the find horizon with clear depressions

In the southwest direction, the lake basin descends: that is why the sedimentation situation changes a little. The loess is overlaid by a layer of clay, which gets thicker in the direction of the lake's centre. It is followed by clayey silty laminated sediments, which are called B4. Basal sands are not common there any more. Instead, dark or light-grey silty layers occur, up to 20 centimetres thick. There are almost no finds in these layers, with the exception of scattered large objects. Then follows a firm grey clayey to silty B3 layer, where a higher find concentration is observed (20 to 40 objects per square metre). Obviously, the former surface changes its position and in this area lies not on loess any more.

The western excavation area is bounded by a redeveloped embankment. In the south and east, the find horizon was disturbed by opencast mining between the 1920s and 1950s. Extensive find material was destroyed, because the disturbances concern the area with the largest find density (Fig. 6). The find horizon in the northern excavation area, as has already been mentioned above, is cut by Weichselian solifluctions.

4.2. Find material

During 2004 and 2005, 142 square metres was excavated, more than 62,000 find objects found, and 16,400 of them 3D recorded. Up to 2005, 49,300 bones, 1,800

teeth, 10,000 flint artefacts and 300 objects from other rocks have been analysed and evaluated. These evaluated finds form the basis of the following description.

4.2.1. Lithics

Flakes outweigh and make up more than four fifths of the inventory. The pieces are very sharp edged, show mostly no transport traces, and often carry a glossy patina. There are also artefacts which make a freshly struck impression. About 20 pieces are cracked and show traces of fire. Occasionally, larger flint rubble and spherical rubble from other rocks are found lying in the find layer too. These must be interpreted as raw material brought by humans, since the find horizon is stone-free, with the exception of very small quartzite rubble.

Cores. Cores make up around 5% of the find material. Diskoid and levalloid forms (Fig. 8: 1, 2) dominate. The cores are very small: from 30 to 60 millimetres. The levalloid forms are represented by partially typical turtle cores. Distinctive features are small, pentagonal in outline cores, with on the striking surface rough, centripetal-based Clacton notch-like flake negatives. The pieces show a rough striking platform preparation. Similar pieces in other Middle Palaeolithic artefact inventories are so far unknown; the only one morphologically identical piece from layer 14 of the Kůlna cave

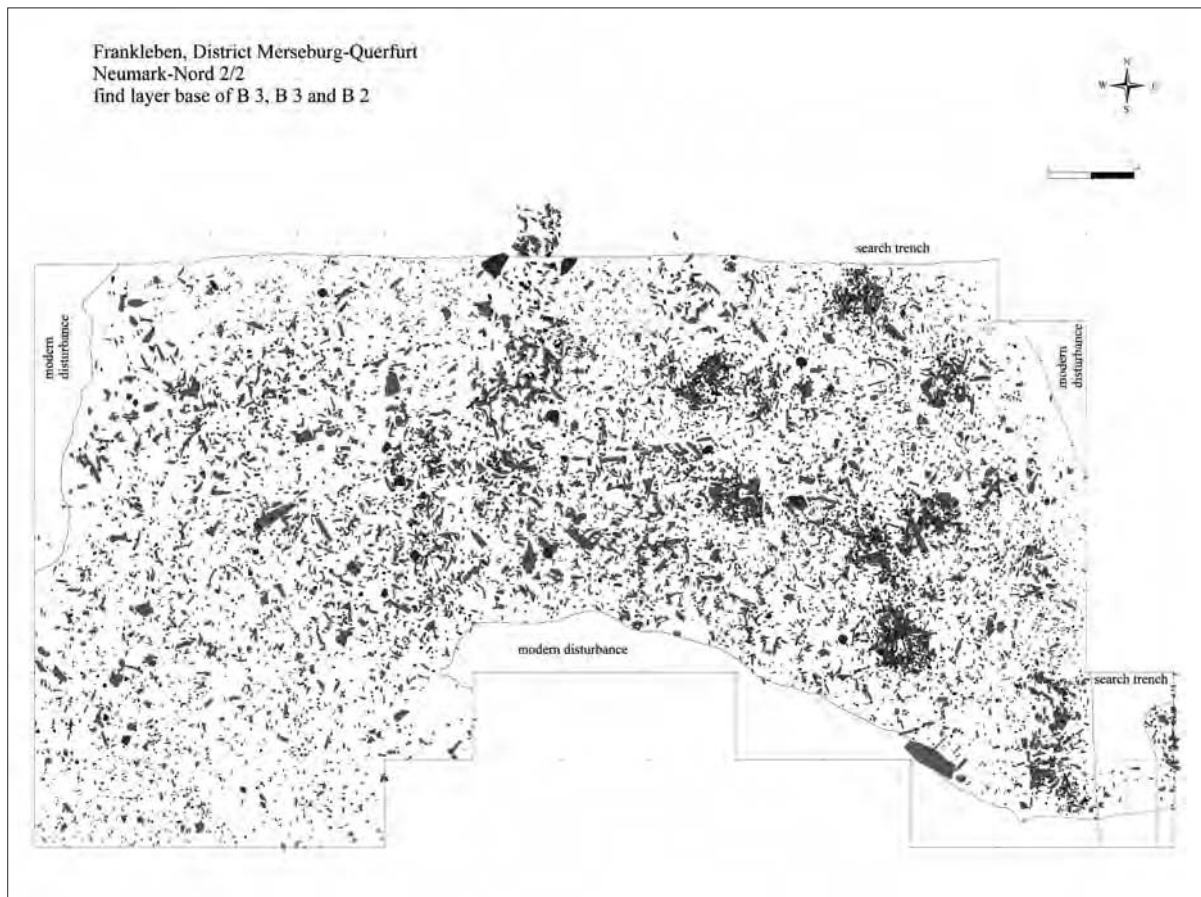


Fig. 6. NN 2/2. The find situation in the southern area, the circular find accumulations, which are tied to the shallow depressions (black – flint, grey – other stones, light-grey – bone) are remarkable

can, however, be considered, due to its singular occurrence as a coincidental morphologic parallel (Valoch 1988). Besides such prepared cores occur pieces which are without the preparation of the reduction and striking surface only in one striking direction reduced.

Flakes. The flakes form the largest group within the stone artefacts, approximately 80% of the material. The dominant ones are small pieces and the knapping debris shorter than 20 millimetres, which lead back to core and tool preparation. The largest flake so far is 69 millimetres long; however, pieces over 50 millimetres are generally rare.

Typical Levallois flakes occur, too (Fig. 8: 3, 9, 15). These are usually very thin and oval to stretched oval form. They show negatives of a centripetal core reduction on the dorsal surface and usually have fine-faceted remains of the striking platform. Other flakes show lateral parts of the prepared core edges, which reveal the fineness of the Levallois core preparation.

The large flakes often have fine splinters on the sharp edges, which indicate the use of these pieces as cutting tools and have to be regarded as use traces.

Tools. The inventory contains a larger amount of modified pieces, too (4%). These are often between 25 and

50 millimetres long, rarely larger, and usually made of flakes. Only occasionally were angular pieces modified as tools. The clearly outweighing part of the tools is formed by simple, very flat Clacton notches (Fig. 8: 5; 6, 8, 10–14). Retouched notches are much rarer. In addition, there are pieces on which several Clacton notches are placed next to each other, so that roughly denticulated working edges were formed. Under the edge-retouched pieces, no special types are recognisable. They usually possess a scraper-like retouched edge retouching (Fig. 8: 4, 7), but it is not possible to assign these tools to any typologically defined type of scraper. Occasionally, Tayac points and small saw-like denticulated tools occur too. So far, only one flake with a steep scraper retouching was registered, just as a piece with a burin stroke. Tools with the unifacial and bifacial worked surface have not yet been observed.

Artefacts from other rocks. Artefacts from other rocks are present, but they are generally very rare. It is mostly a matter of spherical rubble, about five to 15 centimetres large, from quartz, quartzite, sandstone, limestone and porphyry. Among them are two pointed chopping tools (Fig. 8: 16), which are made from quartz rubble. Also, a few pieces of porphyry rubble with striking evidence have been found, just like flakes and blades from



Fig. 7. NN 2/2. Above: base of the B3 layer with a section of a shallow depression.
Below: profiles with part of the depression in plan

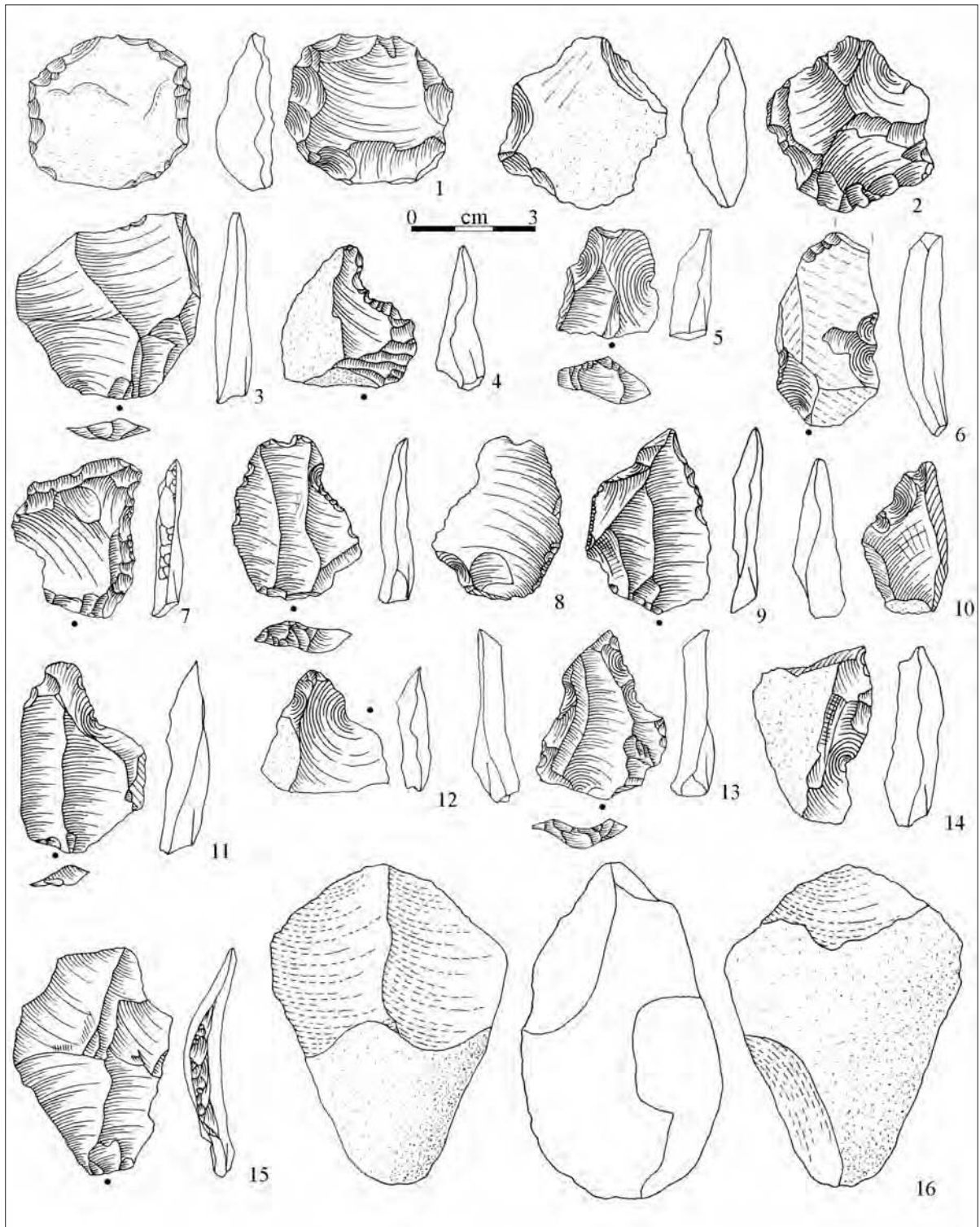


Fig. 8. NN 2/2. Tools: cores (1, 2); Levallois flakes (3, 9, 15); scraper-like tools (4, 7); denticulated tools (5, 6, 8, 10–14); pointed chopping tool (16). 1–15 flint; 16 quartzite

porphyry or limestone. Besides these modified pieces, several pieces of rubble were found, which were used as hammerstones (Laurat, Brühl 2006).

Occasionally, large limestone and porphyry slabs occur in the find layer. They should be considered for the time being generally as manuports, because they could not be transported the natural way.

Summary. The distinctive Levallois technology marks the inventory as a developed Middle Palaeolithic industry. It matches the Mousterian. The entire collection is to be called small-sized. The small dimensions seem to be intentional; the tools were made from relatively small flakes, although larger pieces of raw material in this area are present. If resharpening or similar rework-

ing occurs, it does not lead to noticeable size changes of the only edge-retouched pieces. The turning of the edge retouching into facial or flat retouching has not so far been observed. The small sizes of the artefacts also make it possible to interpret the inventory as Taubachien in the definition of Valoch (2000).

In general, the collection has similarities to those of Taubach and Weimar-Parktravertin (Behm-Blancke 1960; Valoch 2000), as well as to artefacts of the bank area of the lake basin Neumark-Nord 1 (Mania 1990; Brühl 2004). At the same time, clear differences from the latter are present too, especially by the core reduction technologies and the composition of the tool-kit (Brühl 2001). The main common features of both assemblages, like the occurrence of notched and denticulated pieces, the occurrence of scraper-like pieces without typical type features, and the absence of bifacial tools, must be regarded at this point in the investigation as a parallel, which leads back to the similar economic and ecological conditions on the banks of the two lake basins.

4.2.2. Organic material

Approximately five sixths of all the finds (80%) represent organic find material. The sieving finds are more extensive by far. All find objects larger than three centimetres (with the exception of complete or smaller bones and teeth or other exotic faunal remains) were 3D recorded. The preservation conditions for the bone and tooth material are good to very good. Antler remains are so far very rare, and show a clearly stronger degree of weathering. Bones with a stronger surface weathering occur very rarely. At the basis of the find layer, the bone material is often solidly cemented by lime and partly crushed.

Recently recognised are bovids (*Bison priscus* and *Bos primigenius*) (Fig. 9: 1, 4, 6), cervids (*Cervus elaphus* and *Capreolus capreolus*) (Fig. 9: 5), two species of horse (*Equus sp.* and *Asinus hydruntinus*), *Ursus sp.* (Fig. 9: 7), two smaller species of carnivore (possibly *Canis* and *Vulpes sp.*) and the straight-tusked elephant (*Elephas antiquus*). Bovid and equid remains predominate in the find material, followed by the cervids. Besides these, there are also the remains of small mammals (*Clethrionomys glareolus*, *Arvicola arvalis-agrestis*), birds (among others *Falco sp.*) (Fig. 9: 3), reptiles (*Emys orbicularis* [Fig. 9: 2], *Vipera berus*, *Lacerta vivipara*), amphibians (*Rana sp.*) and fish (*Esox lucius*, *Scardinius erythrophthalmus*) (Mania et al 2005). Elutriating samples contained a lot of fragments of rodent bones and teeth, as well as mollusc shells.

The faunal remains represent *Elephas antiquus* fauna of a fully developed interglacial character. It is indicated by the occurrence of *Elephas antiquus* itself, *Clethrionomys glareolus* and especially *Emys orbicularis*. Also, the mollusc society is interglacial and includes the accompaniment elements of *Helicigona banatica* fauna with *Cepea hortensis*; *Helicigona banatica* itself is absent (Mania et al 2005; Meng 2005).

For the most part, the large mammal bones are smashed; complete bones are missing, with the exception of smaller phalanx, carpal, tarsal bones, pelvis and vertebrae. Complete long bones are preserved very rarely. The break edges of the bones show that these were smashed in a relatively fresh, fatty condition. Therefore, a chopping-up of the bones by long-term weathering on the surface is to be excluded. Cut marks on numerous bone fragments, splinter holes on the long bones (Fig. 9: 1), the mentioned pointed chopper (Fig. 8: 16) and anvil technology, all show a purposeful smashing of the skeleton. All mentioned characteristics speak for an artificially selected fauna by early man.

A few pieces of smashed long bones were arranged as tools and/or used as tools. Both waste products of the tool production (for instance, bone flakes) and finished tools are present. So far, two chisel-like tools have been identified. One of these chisels was used furthermore as a bone pressure, and has many pronounced scars which consist of linear arranged splinters. Besides, at least two more bone pressures are present, which are characterised by similar features.

4.3. Interpretation of the find situation

As the archaeological excavations are still going on and the diverse geological as well as palaeontological and archaeological investigations are not yet finished, it is too early to make a clear statement about the interpretation and meaning of the find horizon. So far, the majority of the finds in the southeast and middle parts of the excavation area are found almost on the basis and/or directly on the basis of find horizon B3 and on the loess which marks the former surface. These finds are autochthonous and show no redeposition evidence. Alignments are not recognisable. Stone artefacts very often stand vertical on their longitudinal edge in the sediment, or are with distal or basal ends in the loess. Something similar applies to smaller bone chips. Only in the western and southern area do the finds not lie any longer on the loess, but approximately 20 centimetres above it within the upper part of find layer B3, which means that the former surface is not loess any more, but lake sediment. Beneath them are different



Fig. 9. NN 2/2. Organic material: 1 the long bone of a bovid with impact traces; 2 a shell rest of *Emys orbicularis*; 3 bird claw (*Falco sp.*); 4 metapodium (bovid); 5 pelvis (cervid); 6 lower jaw (bovid); 7 upper jaw (bear)

silt and clay layers of changing colour with very few or no finds.

The investigation of the find layer in the eastern part of the excavation area showed that the finds often lay in shallow depressions, 60 to 80 centimetres large and about 15 to 25 centimetres deep (Fig. 5–7). Six of these depressions build a circle of three metres in diameter and are regularly distributed (around one to 1.5 metres

from each other). A further depression lies outside this circle. The distinguishing feature within these depressions is the density of the finds: more than 100 finds per square metre lie on the basis and form one layer. The fact that the find material concentrates on the bottom and walls of the depressions, while the deepest part never contains any finds (eg Fig. 7) is worth attention. Since basal sands in these depressions are clearly

more powerfully developed, it is possible to exclude the emergence of the depressions after the sedimentation of the overlying layers. So far, the origin of these depressions has not yet been clarified and is an object of resuming investigations. At the moment, neither a natural process, which could lead to the formation of such structures, nor another comparable situation, is known.

In the superjacent layers (layers A, B1 and B2) the size of the objects decreases, above all the bones, as well as typical fractionation after size and weight is present. The alignment measurements show that it concerns parautochthonous finds already transported and displaced by flowing water or other processes. Moreover, the flakes very often lie with their ventral side upwards. The similar preservation of the organic as well as the lithic finds in all horizons speaks for the fact that the transport of the finds in layers B2, B1 and A did not take place over longer distances and not at all from other sites. The complete morphologic- morphometric picture of the artefacts from all horizons confirms that it is a matter of synchronous finds. It is possible to suggest that the finds from layers B2, B1 and A come from higher, weathered sections of the find horizon at that time. So far, the finds from all layers of the find horizon NN 2/2 represent a closed complex according to already done research.

5. The Middle Palaeolithic find complex Neumark-Nord 2/1

The middle and upper parts of Stratacomplex 3 and Stratacomplex 5 contain a low density of find objects, both bones and flint artefacts. This complex is called Neumark-Nord 2/1 (Fig. 3). For a better assignment of the find objects, the complex was subdivided. The layer NN 2/1c, around 2.5 metres above the horizon NN 2/2 (strata 3.3), is important. It is a light grey fine sandy to silty limnic sediment up to 40 centimetres thick. These deposits yielded flint artefacts (eg a fragment of a Levallois flake and some smaller flakes), bones and teeth (Laurat, Brühl, forthcoming). During the fieldwork in December 2006, it was possible to establish some larger openings of Stratacomplex 3. In this profile section it was possible to recognise that the sandy silts belong to a real lake shore that spread over a large area of the lake basin. Polygonal structures in the limnic clays and silts below the sand are indications of a wet soil formation, or several cycles of moisture penetration and the drying of these sediments. Both possibilities underline the interpretation of the sandy silt as deposits on a bank plain. The goal of the following investigation is to make a clear relationship between

NN 2/1 and NN 2/2, and observe the dispersal of the finds in this stratum.

6. The Middle Palaeolithic find horizon Neumark-Nord 2/0

6.1. Sedimentation

The find horizon is situated over the Eemian interglacial optimum and belongs to the early stages of the Weichselian Glacial (Fig. 3, 15 above). Due to the opencast mining activities in the 1920s to 1950s, the eastern and the northeastern part of the excavation area, and at the same time the most find-rich part, was cut by the mining (Fig. 11). The northern part is restricted by the slope, even though it did not substantially disturb the site. For the complete excavation area, the altitude of the find horizon is about 102 metres above sea level.

The find horizon is situated on the denudation surface of the lake shore (Stratacomplex 7). It is around ten to 20 centimetres thick and formed by fine to middle-grain white to light grey or yellow sand which contains only a few coarse-grained components (Fig. 10). Towards the top the sands are finer, and go over to silty sediments. The complete find horizon is covered by the black decomposed peat of a shallow bog (Stratacomplex 8). The finds concentrate in the basal parts of the sands. The larger finds in particular concentrate on the basis of the sand layer, directly on the denudation surface or even pressed into the mud (Stratacomplex 6). Often the sands containing the finds are found in pocket-shaped cryoturbations in the subjacent mud. Eastwards, the sands become more fine-grained and silty, and the thickness of the find horizon increases up to 50 to 60 centimetres, but also here the finds are situated predominantly close to the basis.

The sedimentation of the bank sands took place synchronously with the activities of humans on the bank area. Sands were by redeposited transgression and regression processes, so the small finds (like small stone artefacts or bone splinter) were also affected. Therefore, the clearest indication for the flooding processes of the bank area and the redeposition of the smaller find objects is the drift lines, which are aligned in a southwest-northeast direction (Fig. 12). These are recognisable as linear lines-up, whereby the small bones and stones with their longitudinal edges lie parallel to the former drift line. Larger objects are not included in these linear structures. These drift lines show at the same time the surface contour lines, which were verified by geoelectrical sounding (Rappsilber 2004).

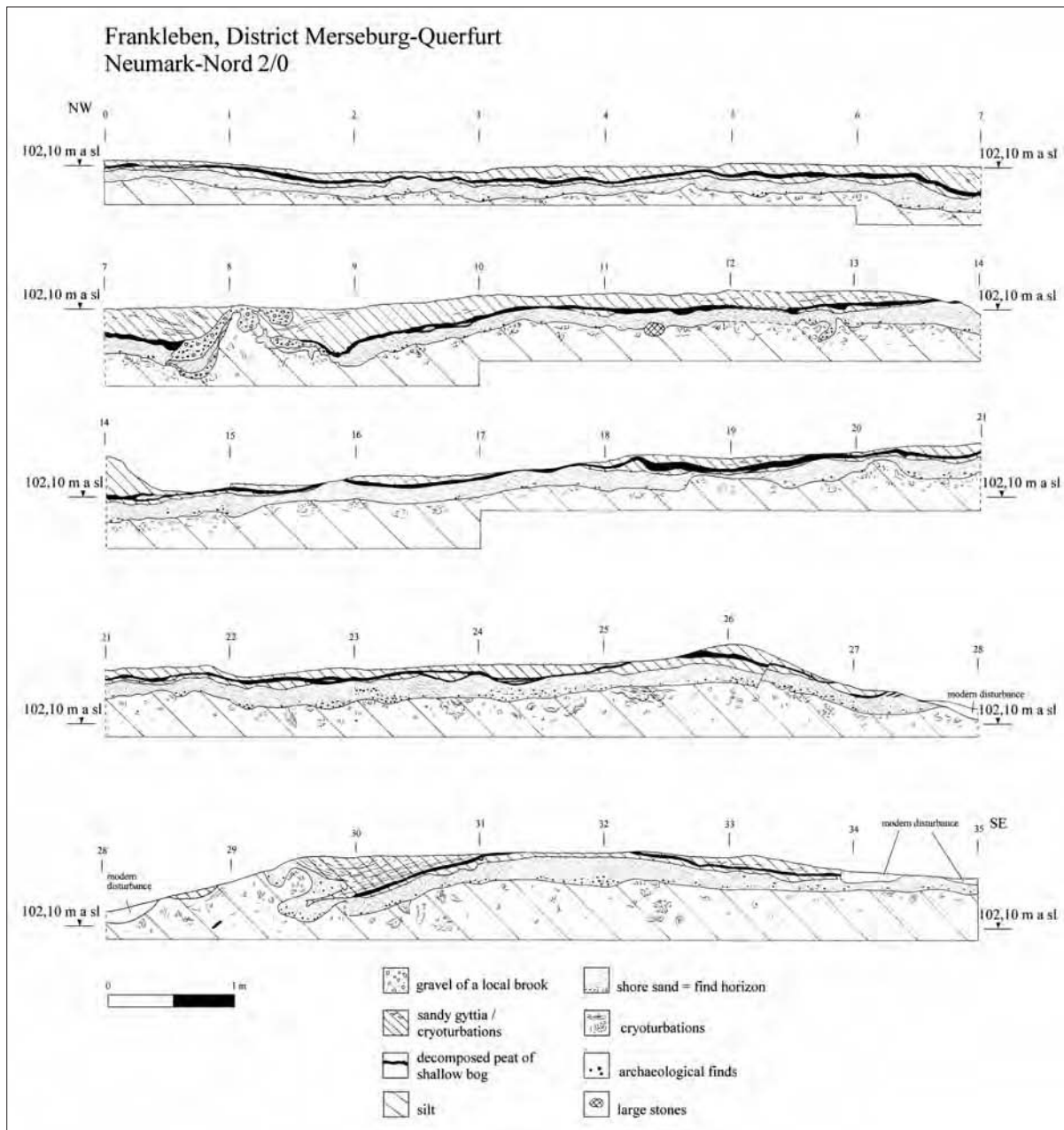


Fig. 10. NN 2/0. A profile of the find horizon

6.2. Find material

During the investigations in the years 2003 and 2004, 388 square metres were excavated, of which more than 330 square metres was a jointed area in the northern and central part of the excavation area. A total of 5,510 finds were 3D recorded, among them 3,160 flint and stone artefacts, and 2,350 objects from organic material. A further 9,000 objects, half bones and teeth, half lithics, were found by sieving the area.

6.2.1. Lithics

At the moment, more than 8,100 flint artefacts are known, 7,700 were found during the excavation in

2003 and 2004. The largest part of the inventory consists of flakes (86%). Cores (5%), tools (5%), debris (3%), and natural stones (2%) are much more rare. The last ones are flint pebbles 30 to 100 millimetres large and characterised by cortex and fossil inclusions. It is possible to describe them as manuports (transported by humans), since due to the finding situation in fine to middle-grain sands they could not be transported in a natural way. The artefacts are very often glossy and patinated, whereby the colours vary between dark grey and black to yellow. Moreover, the finds have a slightly weathered surface, which suggests the transport of the objects in the sandy milieu or the result of the circulating drain or ground water after the finds were embedded in the sand. However, the last interpretation is at

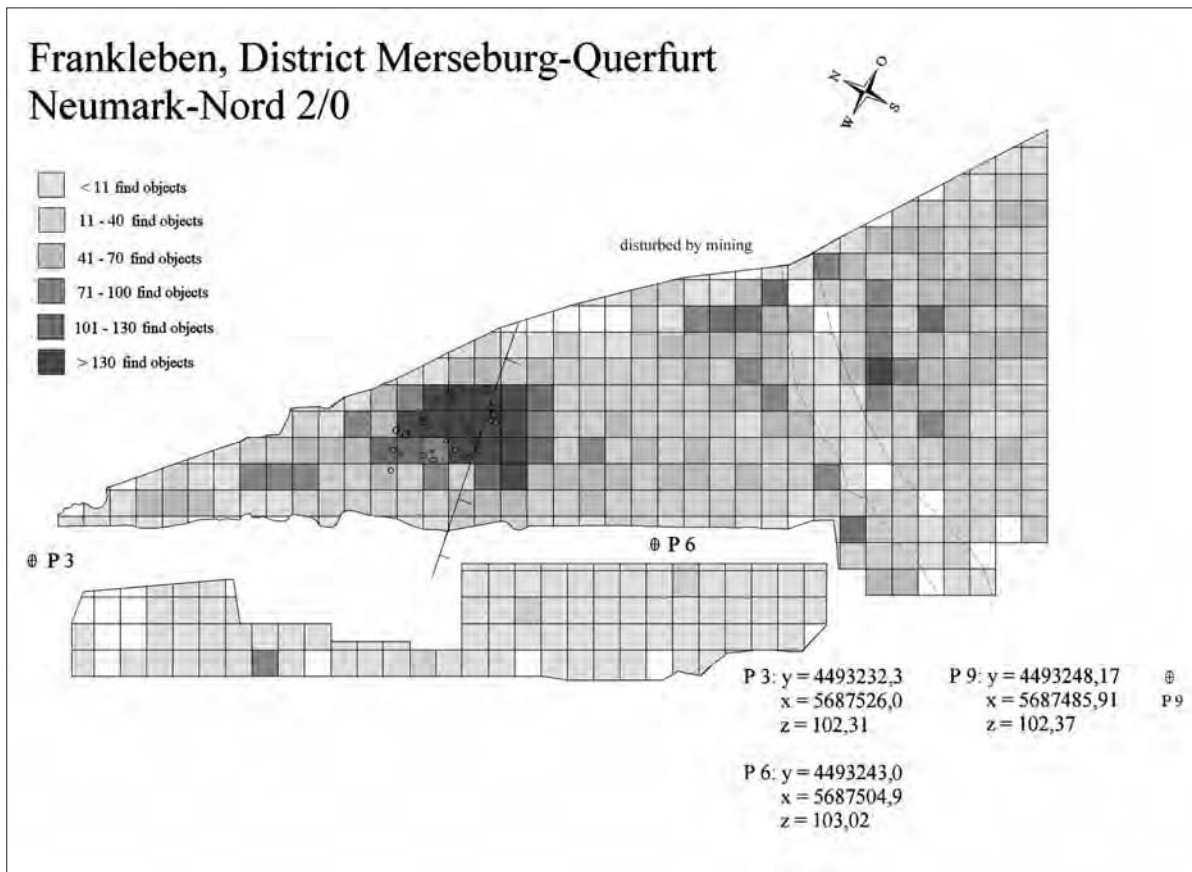


Fig. 11. NN 2/0. The distribution of finds in the central area with erratic blocks marked

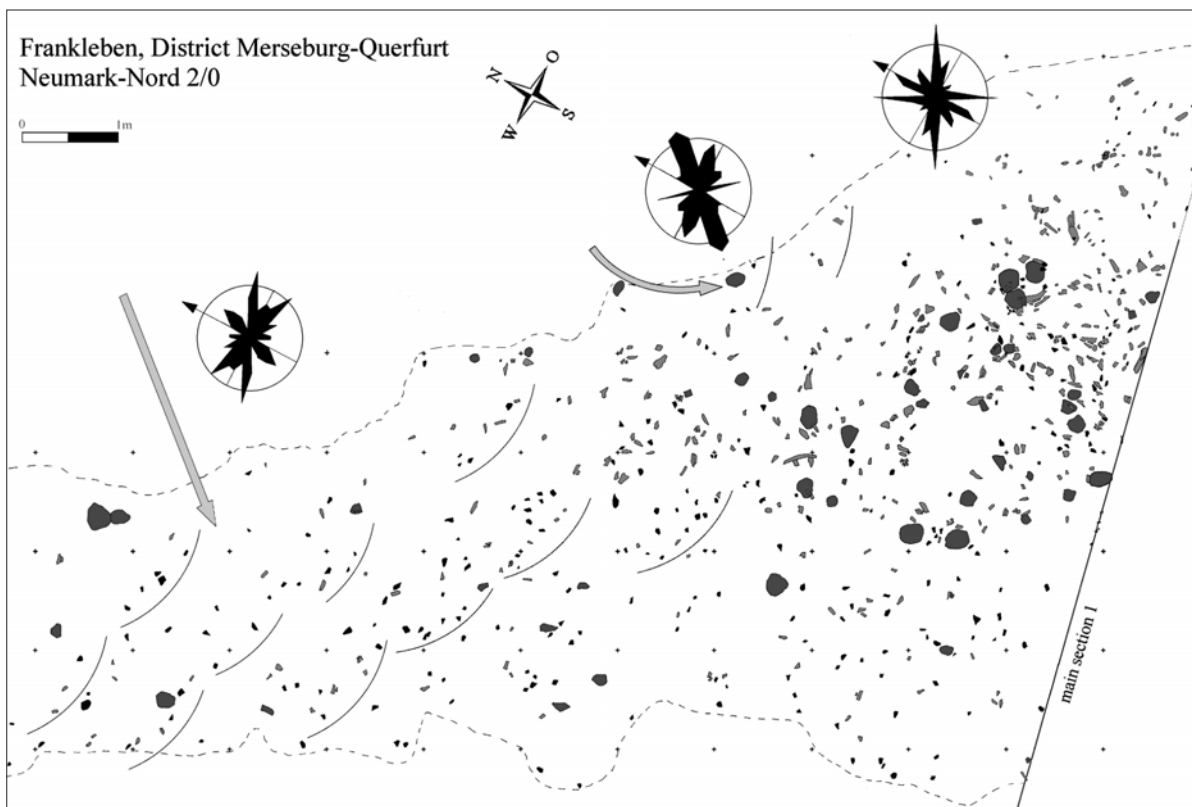


Fig. 12. NN 2/0. A former shore of the lake. Find alignments by water transgressions (black – flint, light-grey – bone, grey – erratic blocks)

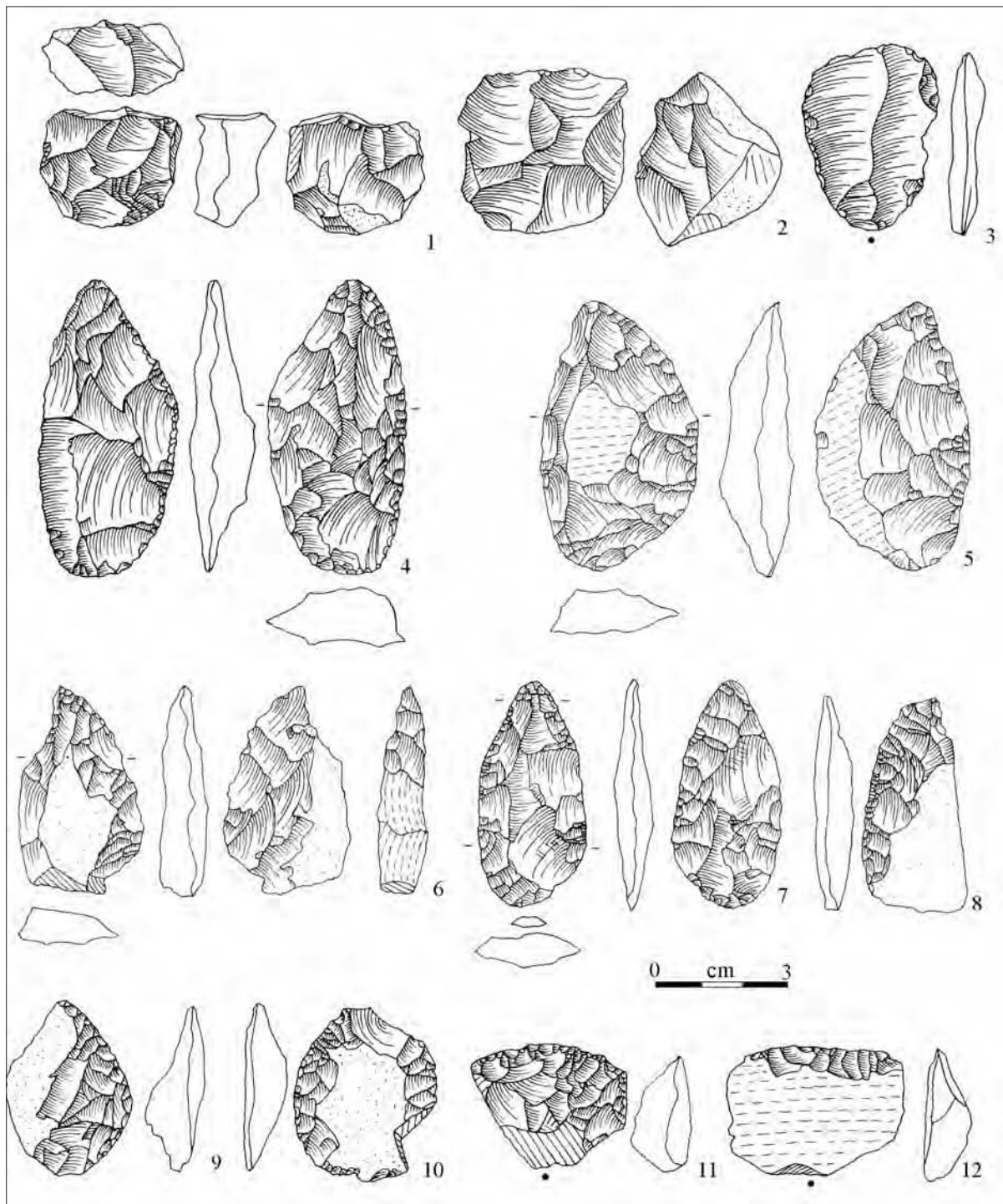


Fig. 13. NN 2/0. Flint tools: cores (1, 2); flake (3); Keilmesser (4–6); bifacial leaf point (7); scrapers (8–12)

the moment the most probable, while according to the finding situation, the finds are reassorted only at maximum a few centimetres or decimetres.

Cores and core-like objects. Approximately 260 cores and core-like pieces have been found. Most of them are simply stroked pebbles without any characteristic form. There are only a few pieces of Levallois cores (Fig. 13: 1, 2). A few core-like items and objects with striking evidence probably represent tools or semi-manufactures. In general, both initial cores and exhausted cores

are very small, 40 to 50 millimetres and correspond with the sizes of found pieces of debris. Larger cores have not so far been found.

Flakes. With more than 6,740 pieces, flakes form the largest group of the flint inventory. The dominant ones are small pieces (Fig. 13: 3) and knapping debris of ten to 20 millimetres length, which originate from the manufacture or the resharpening of the tools. In addition, occasionally larger flakes (over 70mm) occur, and it often concerns irregularly formed pieces. Since

cores of this size are not recorded, it can be assumed that these flakes were not produced on the spot. The absence of not modified Levallois flakes is remarkable, though the negatives on a few cores prove their production. Blades are very rare; so far there are only 20 items recorded. Blade cores are so far completely missing. At least 40 flakes show evidence of use.

Tools. A total of 390 pieces of tools have been found (Fig. 14). They are like the entire inventory of a small size. Usually, pieces of natural debris serve as a starting point for further treatment. Tools made from flakes are much more rare. The most dominant tools are typical Middle Palaeolithic scraper forms (Fig. 13: 8–12): single and double-side scrapers, transversal scrapers and convergent pointed scrapers. The single-side scrapers are usually arranged as convex-side scrapers, less as straight-side or concave side scrapers. The scraper edges are stepped and finely retouched. Besides edge retouching, typical flat surface retouching, both unifacial and bifacial, occurs. The bifacial scrapers cannot always be differentiated from backed bifacial knives (Keilmesser) (Fig. 13: 4–6), which are the most characteristic forms in the NN 2/0 inventory. They are small, and have a maximum length of 30 to 60 millimetres. It is remarkable that the bifacial workings have not always been completed, and the remains of the cortex or another original surface are often present. It indicates that the tools were manufactured consciously in such small dimensions. Different Keilmesser types are present, as are triangular Bockstein as well as segmental Wolgograd knives (Fig. 13: 4–6), but the last-mentioned predominate. Besides Keilmesser occur small-hand hammer and bifacial leaf-shaped points (Fig. 13: 7). The latter are also unusual by their small size: the smallest is only 30 millimetres long.

End scrapers, naturally backed knife and Quinson point represent other tool forms of the inventory. Another special type are thin flakes with unretouched lateral edges and a natural or thinned back. The items with thinned back were possibly used in shafts. In addition, there are several tools which do not belong to any classification. This usually concerns debris pieces with a short scraper-like retouched edge.

Debris. This concerns 40 to 60-millimetre-long pieces with twisty edges and percussion negatives. They are irregularly distributed and cannot be classified as any artefact type.

Artefacts from other rocks. Apart from the flint, there are at least 110 pieces (including manuports) from other rocks, like quartzite, shelly limestone, sandstone or metamorphic rocks. So far, six choppers, six hammerstones and a scraper made on metamorphic rock are re-

corded as artefacts. Several of them carry clear impact traces, so that they could have been used as anvils.

In the central part of the excavations, 22 not modified globular stones have been found. These granite and granodiorite erratic blocks have diameters of 15 to 25 centimetres and weigh up to 25 kilograms and lie in the restricted bank area of 2.5 to 3.5 metres forming the diffuse circle structure (Fig. 11, 12). These stones turn out to be of an anthropogenic origin and should be regarded as manuports, as they could not have been transported a natural way.

Fossils. Besides the above-mentioned finds, several fossils have been found which probably belong to the early Tertiary or older epochs, eg four shark teeth (*Odontaspis sp.*), seven corals, one belemnite, several fossil shells and two shells of the scaphopodia (*Dentalium sexangulum*). Such specific (non-utilitarian) finds were observed on other Middle Palaeolithic sites, too (Schäfer 1996), but it is hard to regard them as brought by humans.

Summary. The small size of the artefacts is above all remarkable. The tools are predominantly between 30 and 50 millimetres; the largest so far is 80 millimetres. The purposeful production of such a small-sized inventory, which cannot be attributed to the raw material conditions or to size reduction by use and resharpening, must therefore be connected with the cultural and/or economic background. Probably some of the tools were used in connection with a haft, like the birch pitch remains found in Königsau (Koller et al 2001). A further characteristic of the inventory is the very pragmatic use of the raw material. Although there was very good and large-sized flint material available not far off, flint of lower or even bad quality was used as a raw material, such as natural pieces for tool production. This could explain the dominance of retouching waste.

The predominance of scrapers and bifacial tools, particularly Keilmesser, bifacial scrapers and bifacial leaf points, and the absence of typical Levallois technique and blank production, assign the inventory to the complex of the Keilmesser group (Bosinski 1967; Mania, Toepfer 1973; Jöris 2003) or Micoquo Prądnikien (Burdukiewicz 2000). Although there are typological resemblances to the other Keilmesser sites in central Germany, like Bilzingsleben 2 (Weber, Mania 1982; Potengowski 1997), Königsau (Mania, Toepfer 1973; Mania 2002), Lindenthaler Hyänenhöhle (Auerbach 1929; Mania, Toepfer 1973) and Oppurg Gamsenberg (Schäfer, Zöller 1996; Schäfer et al 1991) and its subgroups (Bosinski 1967; Jöris 2003; Wetzel, Bosinski 1969; Mania, Toepfer 1973; Mania 2002), it is not sufficient to assign, however, the inventory of NN2/0 to a particular group of the Micoquo Prądnikien in Central

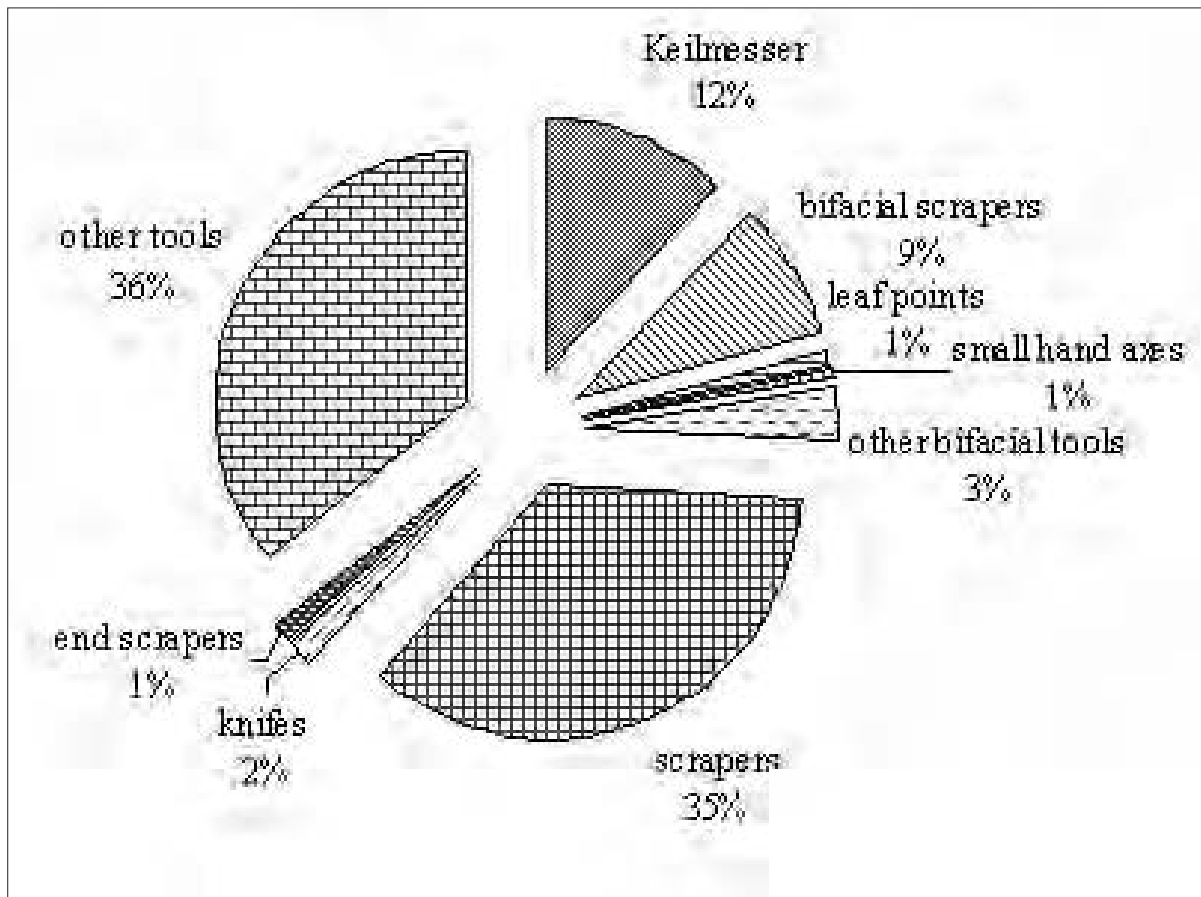


Fig. 14. NN 2/0. The main forms of the tools

Europe. Moreover, there are remarkable similarities between the tools of NN 2/0 (above all the Keilmesser types and scrapers, as well as the composition and dimensions of them) to the eastern forms of Keilmesser groups (the so-called Volgograd Culture according to Otte) (Otte 1996), particularly to the Suchaja Mečetka site near Volgograd (south Russia) (in the older literature: Stalingradskaya stoyanka, Volgogradskaya stoyanka) (Землятин 1961; Праслов 1984; Ščelinskii 1998) and to sites on the Crimean peninsula (Kolossova 1988; Chabai et al 2002).

6.2.2. Organic find material

During the excavation of NN 2/0, more than 5,700 bones and 1,100 teeth were found. The general preservation of organic find material is good. Bones and teeth are often cracked by covering sediments, the surface is weathered and strongly afflicted by mineral crystallisation, what was influenced for the most part by mining activities and followed by the oxidation process. The majority of the bones and tooth finds are long bones; however, remains of all body parts of medium and large mammals' skeletons occur. The bones of bovids (*Bison pricus*), equids (predominantly *Equus sp.*) but also wild ass (*Asinus hydruntinus*) and cervids (*Cervus*

elaphus) prevail. Besides, the remains of a bear (*Ursus spelaeus*) and at least one smaller carnivore species, probably fox (*Vulpes sp./Alopex sp.*) are found, as well as bird (*Cygnus sp.*) and small mammal bones (Arvicolid) (Fig. 15 below). Two small ivory lamellas, probably of mammoth, are represented in the find material, too.

Cut marks on numerous bone fragments, as well as splinter holes on the long bones, show an intentional smashing of the skeletons. The bone material is strongly fragmented, so it is possible to suggest that it was probably smashed in a relatively fresh condition. Bone flakes in the inventory point to bone tool production on the spot. At the moment, it is possible to interpret them only as a coincidental product, since the analyses are not yet finished. Three long bone fragments were probably used as retouchers, according to the regularly placed scars on the bone surface.

6.3. Interpretation of the find situation

The find objects, bones, teeth, as well lithic artefacts, are quite regularly distributed, but the number of finds decreases in the southern area. The general density of the finds is rather low (Fig. 11, 12); most square metres



Fig. 15. NN 2/0. Above: a view of the excavation area. Below: organic material. Lower jaws of small mammals (Arvicolids)

yielded not more than 50 objects. Most finds are connected to the above-mentioned find alignments, which are oriented from southeast to northwest and are recorded almost across the complete excavation area. In these alignments, the objects are regulated in two main directions (Fig. 12). The alignments are formed by the transgression of the water which flooded the lake bank shortly after early man left, and created a parautochthonous situation.

Interesting observations are made in the central excavation area, where a circular structure of erratic blocks is present. This area also has up to 250 objects per square metre and is particularly find-rich (Fig. 11). The

distribution of large bones on the inner periphery of it, including articulated bones, is notable. Bones with cut and impact marks are concentrated mostly in the south and southwest part, both inside and outside the stone circle. At the same time, the portion of the tools (particularly good-quality scrapers and bifacial tools) in the assemblage of this area rises, while flakes are far rarer. All these facts and find conditions allow us to interpret it as a dwelling structure with an unknown function. In this area, the alignment structures are broken, so the erratic blocks worked as wave breakers during the transgression of the lake, which caused no moving or redepositing of small finds in this area.

We preliminarily interpret the site Neumark-Nord 2/0 as a short-term campsite of Neanderthals who disembowelled game here, produced their tools on the spot, and built a dwelling structure.

7. Middle Palaeolithic find complex Neumark-Nord 4

The NN 2 lake sediment succession is discordant, overlaid by a valley train (Stratacomplex 10), which represents fluvial deposits, containing bones and flint artefacts (Levallois flake, fragment of bifacial tool, etc). Most of the artefacts were transported, although there are several sharpened-edged pieces. The age of the artefacts is so far unclear. They could be redeposited finds from older find complexes in this micro-region, or synchronous with the deposition of the gravel complex.

8. Summary

Although the excavations in the lake basin Neumark-Nord 2 are not finished, and different sedimentological, palynological and malacological analyses, as well as dating (TL, OSL, ESR) analyses, are not available yet, it is already possible to make a general and preliminary picture of environmental and cultural development in the Geiseltal micro-region in the Middle Palaeolithic. Due to the unique situation, it was possible to record three different archaeological find horizons in the superposition: all of them are situated over Drenthian

moraine. The older one (NN 2/2) is of interglacial origin, situated directly over the Drenthian moraine, and is indicated by *Elephas antiquus* and *banatica* fauna. The find horizon contains numerous smashed bones and flint artefacts, characterised by the Levallois technology of the developed Middle Palaeolithic, and is dated, so far, to “Intrasaalian” interglacial. The second find horizon (NN 2/1) is situated above NN 2/2 and is characterised by the slight dispersal of bone fragments and flint artefacts. It probably belongs to the beginning of the Eemian interglacial. The youngest find horizon (NN 2/0) lies over the Eemian optimum and belongs to an interstadial within the Weichselian Glacial. Due to the predominance of bifacial scrapers and bifacial tools, particularly Keilmesser and bifacial leaf points, the flint belongs to the Keilmesser group and has especially remarkable similarities with the Keilmesser groups in south Russia and the Crimean peninsula. Numerous bone and flint finds speak for a campsite of hunters with evidence of a dwelling structure.

Of course, there are far more questions at the moment than answers in the interpretation of both sites, but it is still possible to imagine them as temporary camps of Neanderthal hunters, who were hunting diverse game (bovids, equids, cervids, etc) in this area at different times. Probably they settled after (or just before) successfully hunting near the lake shore. How long they stayed there, whether it was a short or a long-term site, whether there were one or different hunter groups, and how large they were: these and other questions should be answered by further investigations.

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References

Auerbach, A. 1929. *Die Lindenthaler Hyänenhöhle bei Gera*. Thüringer Höhlen 1, 46–56.
Behm-Blancke, G. 1960. *Altsteinzeitliche Rastplätze im Travertertingebiet von Taubach, Weimar, Ehringsdorf*. Alt-Thüringen 4, 1–246.
Bosinski, G. 1967. *Die mittelpaläolithischen Funde im westlichen Mitteleuropa*. Fundamenta. A/4, Köln.
Brühl, E. 2001. Zur Ökonomie der mittelpaläolithischen Jäger von Neumark-Nord. In: Mania, D., Wagner, G.A. (ed.) *Frühe Menschen in Mitteleuropa – Chronologie, Kultur, Umwelt*. Aachen, 131–153.

Brühl, E. 2004. Ökonomisch-ökologische Untersuchungen am Inventar von Neumark-Nord 1. *Praehistoria Thuringica* 10, 97–109.
Burdukiewicz, J. M. 2000. Backed biface assemblages of East Central Europe. In: Ronen, A., Weinstein-Evron, M. (eds.) *Toward modern human. The Yabroudian and Micoquian 400 – 50 ka ago*. BAR IS 850, Oxford, 155–166.
Chabai, V.P., Richter, J., Uthmeier, T., Yevtuschenko, A.I. 2002. *Neue Forschungen zum Mittelpaläolithikum auf der Krim - Vorbericht*. Germania 80, 441–473.
Gaigalas, A. 2001. Viršutinio (vėlyvojo) pleistoceno stratigrafija ir geochronologija. In: Baltrušas, V. (ed.) *Akmens amžius pietų Lietuvoje*. Vilnius.
Gaigalas, A. 2004. Succession, chronostratigraphic position and palaeoenvironmental evolution during formation of Saale Complex (Middle Pleistocene interglacial/glacial transition) in Baltic Countries and East Europe (with special attention to Intra-Saale-warm period). *Praehistoria Thuringica* 10, 67–71.
Heinrich, W.D. 1990. Nachweis von *Lagurus lagurus* (Pallas, 1973) für das Pleistozän von Neumark-Nord. In: Mania, D., Thomae, M., Litt, T., Weber, T. (ed.) *Neumark-Gröbern, Beiträge zur Jagd des mittelpaläolithischen Menschen*. Veröffentlichungen des Landesmuseums für Vorgeschichte Halle 43. Berlin, 167–175.
Hunger, R. 1939. *Zwei Diluvialfaunen im Deckgebirge der Braunkohle der Tagebaue Leonhardt bei Neumark im Geiseltale*. Zeitschr. f. Geschiebeforschung 15, 116–124.
Jöris, O. 2003. *Zur chronostratigraphischen Stellung der spätmittelpaläolithischen Keilmessergruppen*. Berichte Römisch-Germanischen Kommission 84, 49–163.
Koller, J., Baumer, U., Mania, D. 2001. Pitch in the Palaeolithic – Investigation of the Middle Palaeolithic “resin remains” from Königsau. In: Wagner, G.A., Mania, D. (eds.) *Frühe Menschen in Mitteleuropa – Chronologie, Kultur, Umwelt*. Aachen, 99–112.
Kolossoff, I.G. 1988. Les débuts du Paléolithique en Crimée. *L'Anthropologie* 92, 808–838.
Kremenetski, K.V. 2000. *Neumark-Nord. Results of pollen analysis*. Moscow. Unpublished manuscript.
Krumbiegel, G., Rufflé, L., Haubold, H. 1995. *Das eozäne Geiseltal*. Neue Brehm Bücherei 237. Wittenberg.
Laurat, T., Brühl, E. (forthcoming). *Zum Stand der archäologischen Untersuchungen im Tagebau Neumark-Nord, Ldkr. Merseburg-Querfurt (Sachsen-Anhalt) – Vorbericht zu den Ausgrabungen 2003–2004*. Jahresschrift für mitteldeutsche Vorgeschichte 90.
Laurat, T., Brühl, E., Jurkėnas, D. (forthcoming). *Frühe Menschen an der Geisel – Die Ausgrabungen im Tagebau Neumark-Nord (Ldkr. Merseburg-Querfurt)*. *Archäologie in Sachsen-Anhalt* 4.
Lehmann, R. 1922. *Das Diluvium des unteren Unstruttals von Sömmerda bis zur Mündung*. Jahrbuch des Halleschen Verbandes für die Erforschung der mitteldeutschen Bodenschätze und ihrer Verwertung 3, 89–123.
Lehmann, H., Lehmann, R. 1930. Die diluvialen Flussterrassen in der Umgebung von Halle a.d.S. In: Weigelt, J. (ed.) *Festschrift für Johannes Walthers*. Leopoldina 6. Berlin, 233–251.
Mania, D. 1968. *Ein mittelpaläolithisches Artefakt aus dem Geiseltal*. Ausgrabungen und Funde 13, 17–19.
Mania, D. 1990. Stratigraphie, Ökologie und mittelpaläolithische Jagdbefunde von Neumark-Nord (Geiseltal). In: Weber, T. (ed.) *Neumark-Gröbern, Beiträge zur Jagd des mittelpaläolithischen Menschen*. Veröffentlichungen

- des Landesmuseums für Vorgeschichte Halle 43. Berlin, 9–130.
- Mania, D. 1998. *Die ersten Menschen in Europa*. Sonderheft Archäologie in Deutschland, Stuttgart.
- Mania, D. 2000. Zur Paläontologie des Interglazials von Neumark-Nord im Geiseltal. *Praehistoria Thuringica* 4, 67–94.
- Mania, D. 2002. Der mittelpaläolithische Lagerplatz am Ascherslebener See bei Königsau (Nordharzvorland). *Praehistoria Thuringica* 8, 16–75.
- Mania, D., Brühl, E., Laurat, T. 2006. Neumark-Nord (Geiseltal): Ein mittelpaläolithischer Fundhorizont aus der Frühphase der Weichselkaltzeit (Untersuchungen von 1997 bis 2003). In: *Quartärforschung im Tagebau Neumark-Nord, Geiseltal (Sachsen-Anhalt) und ihre bisherigen Ergebnisse*. Veröffentlichungen des Landesmuseums für Vorgeschichte Halle.
- Mania, D., Mania, U., Thomae, M. 2004. *Im Wildparadies des Geiseltales vor 200 000 Jahren*. Artern.
- Mania, D., Mai, D.H. 1969. Warmzeitliche Mollusken und Pflanzenreste aus dem Mittelpleistozän des Geiseltals (südlich von Halle). *Geologie* 18, 674–690.
- Mania, D., Thomae, M. 1987. *Neumark-Nord – Fundstätte eines Interglazialen Lebensraumes mit anthropogenen Besiedlungsspuren*. Technische Kurzinformationen – Betriebssektion Kammer der Technik “BKW Geiseltal” 43, 32–51.
- Mania, D., Thomae, M., Altermann, M., Heinrich, W.D., Böhme, G., Laurat, T., Brühl, E., Jurkėnas, D. 2005. Der Litoralthorizont Neumark-Nord 2/2 mit seinem paläolithischen Fundhorizont: Beweis für eine spätsaalezeitliche Warmzeit. Report at the XVI Bilzingsleben-Kolloquium “Das Paläolithikum zwischen 400 000 und 40 000 Jahren v. h. im Elbe-Saalegebiet” from 8 to 10 September 2005 in Bad Frankenhausen.
- Mania, D., Toepfer, V. 1973. *Königsau. Gliederung, Ökologie und mittelpaläolithische Funde der letzten Eiszeit*. Veröffentlichungen des Landesmuseums für Vorgeschichte Halle. Berlin.
- Meng, S. 2005. Die Mollusken von Neumark-Nord. Halle/Saale. Unpublished manuscript.
- Otte, M. 1996. Les groupes culturels du Paléolithique ancien européen. In: Bonjean, D. (ed.) *Neandertal*. Andenne, 225–247.
- Potengowski, G. 1997. Bilzingsleben 2. Unpublished master’s thesis, Friedrich-Schiller-University, Jena.
- Rappsilber, I. 2004. Ergebnisse der geoelektrischen Messungen von Neumark-Nord. Halle/Saale. Unpublished manuscript.
- Ruske, R. 1961. Gliederung des Pleistozäns im Geiseltal und seiner Umgebung. *Geologie* 10, 152–168.
- Schäfer, J. 1996. Die Wertschätzung außergewöhnlicher Gegenstände (non-utilitarian objects) im Alt- und Mittelpaläolithikum. *Ethnogr.-Archäol. Zeitschr.* 36, 173–190.
- Schäfer, D., Jäger, K.D., Altermann, M. 1991. Zur Stratigraphie periglaziärer Decken im thüringischen Bergland- Erste Ergebnisse einer Grabung mit paläolithischem Fundhorizont bei Oppurg, Landkreis Pörsneck (Ostthüringen). *Archäologisches Korrespondenzblatt* 21, 323–334.
- Schäfer, D., Zöller, L. 1996. Zur Charakterisierung des weichselzeitlichen Freilandfundplatzes vom Gamsenberg bei Oppurg/Ostthüringen. In: Uerpmann, M. (ed.) *Spuren der Jagd – Die Jagd nach Spuren. Festschrift für Hansjürgen Müller-Beck*. Tübingen, 235–246.
- Siegert, L., Weißermel, W. 1911. Das Diluvium zwischen Halle a. d. S. und Weißenfels. Abh. Preuß. Geol. Landesanst. NF, Berlin.
- Ščelinskij, V.E. 1998. *Der mittelpaläolithische Fundplatz Il’skaja II im westlichen Kubangebiet*. Jahrbuch RGZM 45, 131–161.
- Thomae, M. 2003. Mollisoldiapirismus – Ursache für die Erhaltung der Fundstelle Neumark-Nord (Geiseltal). In: Brühl, E. (ed.) *ErkenntnisJäger. Festschrift für Dietrich Mania*. Veröffentlichungen des Landesmuseums für Vorgeschichte Halle 57, 509–535.
- Thomae, M., Rappsilber, I. 2006. Beitrag zur Klärung der Lagerungsverhältnisse des Quartärs im Tagebau Neumark-Nord. In: *Quartärforschung im Tagebau Neumark-Nord, Geiseltal (Sachsen-Anhalt) und ihre bisherigen Ergebnisse*. Veröffentlichungen des Landesmuseums für Vorgeschichte Halle.
- Toepfer, V. 1957. *Die Mammutfunde von Pfännerhall im Geiseltal*. Veröffentlichungen des Landesmuseums für Vorgeschichte Halle 16. Berlin.
- Valoch, K. 1988. Die Erforschung der Kůlna-Höhle 1961–1976. *Anthropos* 24 N.S. 16. Brno.
- Valoch, K. 2000. Zur Typologie alt- und mittelpaläolithischer kleingerätiger Industrien. *Praehistoria Thuringica* 5, 47–67.
- Wansa, S. 2005. Ergebnisse der Sedimentanalysen für Neumark-Nord 3 und 2. Unpublished manuscript.
- Weber, T., Mania, D. 1982. *Eine neue mittelpaläolithische Oberflächenfundstelle: Bilzingsleben 2*. Jahreschrift für mitteldeutsche Vorgeschichte 65, 23–51.
- Wetzel, R., Bosinski, G. 1969. *Die Bocksteinschmiede im Lonetal* (Markung Rammingen, Kr. Ulm). Stuttgart.
- Землятин, С.Н. 1961. *Сталинградская палеолитическая стоянка*. Краткие сообщения института археологий 82, 5–36.
- Праслов, Н.Д. 1984. Ранний палеолит Русской равнины и Крыма. In: Борисковски, П.И. (ed.) *Палеолит СССР*. Москва, 94–134.

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TRYS NEANDERTALIO PERIODO RADIMVIETĖS BUVUSIO EŽERO NEUMARK-NORD 2 BASEINE (SAKSONIJA-ANHALT, VOKIETIJA): PRELIMINARI KASINĖJIMŲ DUOMENŲ ANALIZĖ

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Santrauka

Intensyvūs archeologiniai ir geologiniai tyrinėjimai jau nebeeksploatuojamoje anglies rūdos kasykloje Neumark-Nord, buvusioje Geiseltal upės slėnyje, prasidėjo XX a. 9-ojo dešimtmečio viduryje, M. Thomae ir D. Mania atradus vidurinio pleistoceno šiltuoju laikotarpiu susiformavusį ežerą Neumark-Nord 1 bei vėliau dvi vidurinio paleolito radimvietes (NN 1) ežero pakrantėje. Tolesniais tyrinėjimais nustatyti dar 2 ežero baseinai (NN 2 ir NN 3), egzistavę vėlyvučiu vidurinio ir ankstyvučiu vėlyvojo pleistoceno laikotarpiu. Ežerų susidarymas bei jų egzistavimas skirtingu laiku buvo sąlygotas diapirizmo procesų prieledyniniuose regionuose.

Archeologiniai kasinėjimai jauniausiame ežero baseine NN 2, vykdomi Kultūros vertybių apsaugos ir archeologijos departamento Saksonijoje-Anhalt, buvo pradėti 2003 metais ir tęsiasi iki šiol. Buvo tyrinėtos trys vidurinio paleolito radimvietės, kurios yra stratigrafiškai išsidėsčiusios viena virš kitos. Seniausia iš jų (NN 2/2) yra virš Drenthian (Žemaitijos) ledyno morenos bei preliminariai priskiriama „Intrasaalian“ šiltmečiui (maždaug prieš 200 000 metų). Didžiąją dalį radinių sudaro suskaldyti žvėrių kaulai (įvairios bovidų, cervidų rūšys, miško dramblys *Elephas antiquus*); titnago inventoriui būdinga išvystyta Levallois technika. Neandertalio laikotarpio medžiotojai apsistojo ežero pakrantėje po sėkmingos medžioklės, tačiau ar tai buvo ilgalaikė ar trumpalaikė stovyklavietė, ar buvo viena ar kelios medžiotojų grupės, bus galima atsakyti tik atlikus visus tyrimus. Virš šios radimvietės buvo aptika ežero pakrantės nuosėdų, kuriose taip pat buvo rasta negausių žvėrių kaulų fragmentų bei titnago dirbinių. Radimvietė buvo pavadinta NN 2/1 ir greičiausiai priklauso Eemian (Merkinės) šiltmečio pradžiai. Jauniausioji NN 2/0 radimvietė yra datuojama Veichselio (Nemuno) ledynmečio pradžios interstadialu. Specifiniai titnaginių įrankių tipai (iš abiejų pusių retušuoti gremžtukai ir bifacialiniai įrankiai – Keilmesser bei

bifacialiniai lapo formos antgaliai) leidžia priskirti titnago inventorių Keilmesser grupei; ypač atkreiptinas dėmesys į panašumus su rytine grupe Pietų Rusijoje bei Kryme. Gausūs žvėrių kaulai, titnago radiniai bei pastato-palapinės pėdsakai rodo čia stovyklavus vidurinio paleolito medžiotojus.