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PRELIMINARY REPORT ON THE NEOLITHIC BOG SETTLEMENT OF NIEDERWIL

(Figs. 1–13)

INTRODUCTION

Through a number of famous finds, such as a very fine battle axe (*Knaufhammeraxt*), a complete wooden bow and a wooden dagger-like object, and by the presence of wooden floors the Neolithic bog dwelling of Niederwil (Gemeinde Gachnang, Kt. Thurgau, Switzerland) has kept a certain fame (Fig. 1), although it is many years since the last finds were made (Pupikofer, 1863; Keller, 1863, 1878).

The settlement became the type site of the so-called *Packwerkbau*, a form of lake dwelling, thought to be constructed, not on piles, but on a number of crossing timber layers, the deepest one of which would have rested on the lake bottom. When excavating at the site in 1862 Messikomer found as many as 22 superposed timber layers. The discussion on the interpretation has continued into recent years.

Peat cutting had brought to light the first finds. With interruptions, the exploitation of the bog went on through the years. The settlement itself remained untouched apart from small-scale soundings, most of them in the first decennia after the discovery.

The bog is situated in an oval depression (300 × 200 meters) in a moraine ridge between the valleys of the Thur and the Tegelbach.

The stratigraphy of the sediments in the basin has been studied by means of several series of borings. The basal layer consists of a blue sticky clay, the lower part of which is clearly laminated. On top of this sediment is a stiff gray clay-mud. The clay-mud is succeeded by necron-mud, which in the centre of the basin reaches a thickness of nearly 5 m. The necron-mud varies in colour from deep purple in the lower to grey-green in the upper part. Of the peat which formed on top of the lake sediment, only a few remnants along the edge of the basin survive.

The bog now bears a wet vegetation, including *Molinia coerulea* (purple moor-grass), *Schoenus nigricans* (bog rush), *Parnassia palustris* (grass of Parnassus), *Epi-*

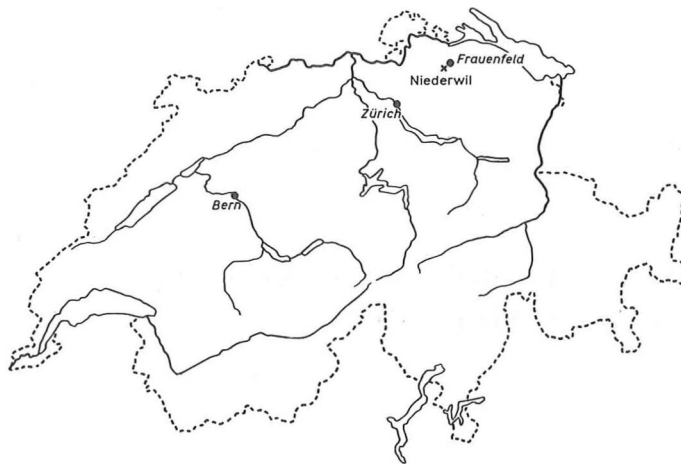


Fig. 1. Niederwil. Location of the site.

pactis palustris (marsh Helleborine), *Liparis loeselii* (Fen orchis), *Primula farinosa* (bird's-eye primrose), and *Filipendula ulmaria* (meadow sweet).

The settlement area could be recognized as a somewhat higher, oval area, measuring 70×40 meters (Fig. 2). It is situated near the southeastern edge of the bog, at a distance of 30 meters from its edge.

Our excavation took place in 1962 and 1963, since the bog was to be used as a sedimentation basin for the waste water from a new sugar-beet factory.

THE SETTLEMENT

The occupation layer has a total thickness of more than three meters. It consists of a series of structures, each containing a succession of wooden house floors. Each floor has a loam cover and a substructure of 2 to 6 crossing timber layers (Fig. 3). The number of floors is about 20. The wood was preserved in all but the topmost floors. The main reason for rebuilding the houses must have been the sinking of the floors in the water-logged gyttja. An additional cause was the destruction of the houses by fire, more than once attested in our excavation.

As to the position of the habitation layer in relation to the bog stratigraphy, the following can be remarked. In the side of one of the trial trenches the occupation horizon, which could be traced for some distance outside the settlement, appeared to correspond with the transitional layer between gyttja and peat.

In 1962 our trench of 32×4 meters cut obliquely through 4 parallel houses. Only

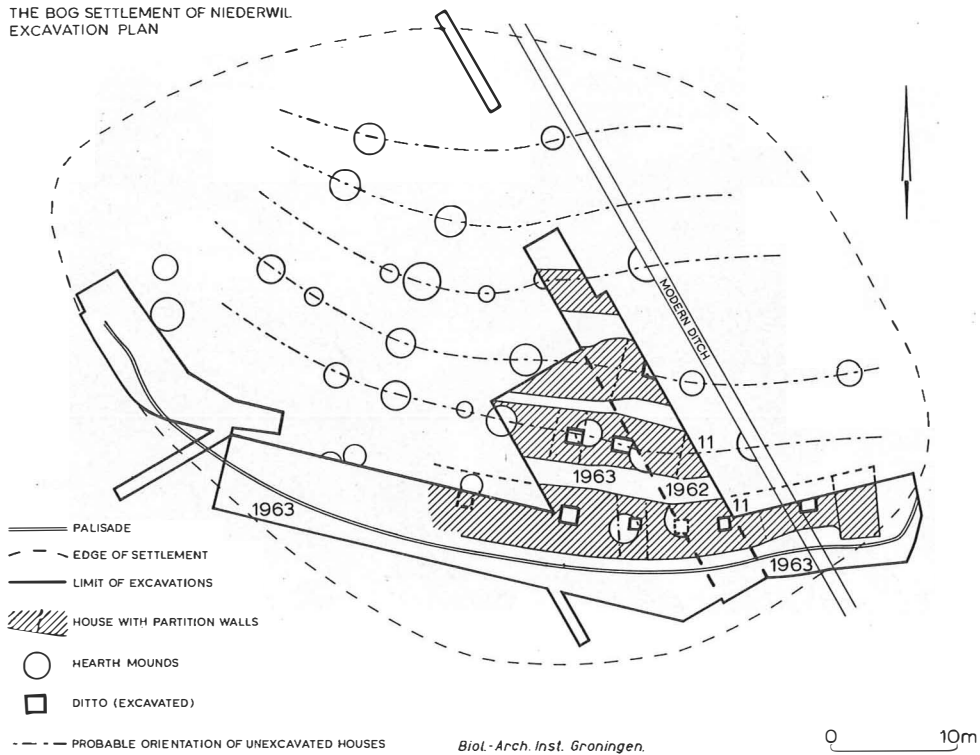
THE BOG SETTLEMENT OF NIEDERWIL
EXCAVATION PLAN

Fig. 2. Niederwil. Excavated area and situation of hearths.

two of them could be excavated to the bottom. The floors had a width of 5 meters, the distance between them was $1\frac{1}{2}$ meter.

Since no one of these house floors showed a definite end, we broadened part of the trench in 1963 to a total width of 12 meters, but, as even then no house end was found, it was decided to follow one house over its total length, excavating only a longitudinal half of it (Fig. 2). It turned out that its total length was more than 60 meters, and that it was subdivided in sections, each with a length of some 10 meters. Some of the sections were subdivided in two parts of unequal length.

Each room had a square fire-place, showing as a thicker layer of loam, and a somewhat heavier substructure. In general they remained on the same spot, with the result that the floors sank much deeper at the fire-places than in between them. On the other hand, the extensive drainage of the basin, and the decay of the wood of the top floors caused the fire-places to emerge as low loam barrows (10–25 cm high, 1–3 meters in diameter) from the surface of the settlement area.

The plan of these fire-place mounds shows them to occur at fairly regular distances in slightly curving parallel rows. This plan in combination with the actual

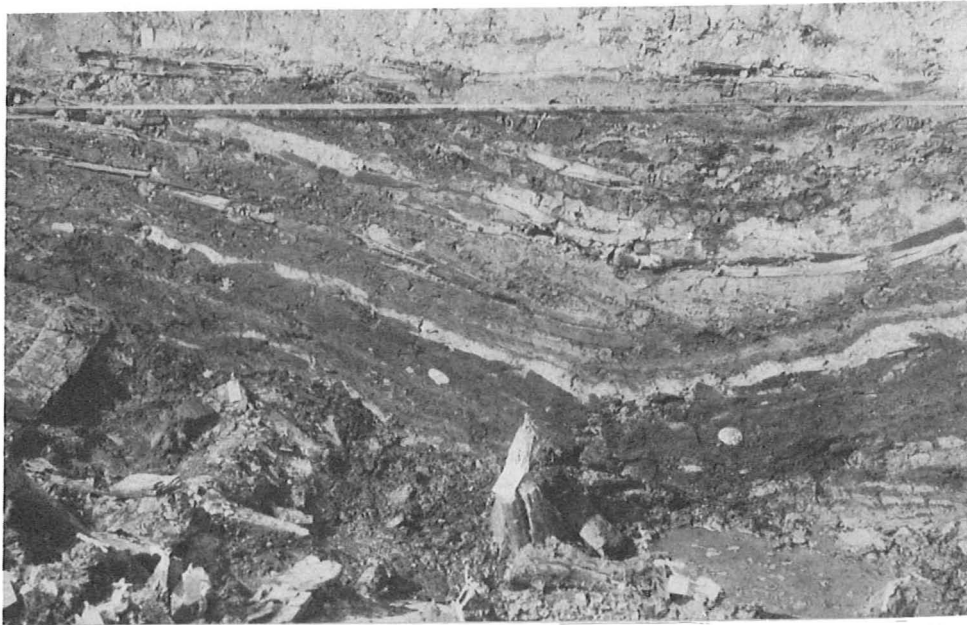


Fig. 3. Niederwil. Section through floor layers of house I.

excavation, leads to the conclusion that the settlement consisted of 6 parallel long buildings (Fig. 2).

The floors mostly consisted of planks made by cleaving heavy oak timbers, and, with a few exceptions, placed transversally (Fig. 4). Sometimes they consisted of densely laid round timbers of much smaller diameter, not unlike those used for the substructure.

Alongside the houses wall posts were found. They consisted mostly of round poles and were very long (7 meters); they rested in the subsoil of the basin, or at least in the stiff Late-glacial clay-mud on the bottom. They probably bore the roof and walls of the houses, but were constructionally *independent* of the floors, which more or less floated in between them.

The drainage of the bog caused the floor masses to sink. This sinking, however, was resisted by the wall posts, anchored as they were in the bottom of the basin, and immovably fixed in the masses of the substructures of the floors and path-ways between the houses.

We found that as a result of this resistance the floor masses have undergone a considerable side-ward movement (more than 6 meters) towards the bog edge during sinking. The wall-posts broke off in the basal lake sediments. Notwithstanding great technical difficulties we managed to observe this, with small variety in depth (between $3\frac{1}{2}$ and 4 meters below the surface) for a number of 12 posts.

Some wall posts had burnt tops. These top ends must have been situated at the original floor level. The obliqueness of our trench in relation to the direction of the houses, prevented us, however, from following the individual posts from their top to their base. But from the mean top level of the posts, the mean inclination of the posts (28°) and the mean depth of breaking-off, the original floor level could be calculated. It brought us to a level of more than 2 meters above the present surface,

From the combined result of the sinking during habitation and the recent drainage, the deepest floors now occur nearly 5 meters below their original level of construction. Apart from side-ward movement, there may also have been a torsion, for the mean vertical projection of the wall posts shows an angle of about 5 degrees to the direction of the houses. This torsion, however, cannot be responsible for the complete curve in the house, part of it must be original.

The total length of the houses was not reached at once; the sections show that in the early stages the houses had a length of only 36 meters. The evidence points rather to a sudden doubling of the length than to a gradual growth. There is some evidence for a very first stage in which the houses were not longer than 10 meters.

Since the top layers are for the greater part decayed, there is no absolute proof that the total length of 60 meters indeed has been in use at one given moment. Still, this is highly probable, for the settlement is surrounded by a fence, enclosing the whole of it. In any case a total length of at least 36 meters for the early and 27 meters for the later stages is proved. The principle of long houses, subdivided in separate rooms, is sufficiently ascertained.

Before turning to the fence, a word must be said on the actual walls. Only locally are they found. They always consisted of horizontal planks, kept in place by relatively thin inner posts and – by inference – by the heavy wall posts, which are no longer in their original position. In one case, a wall was intact to a height of two planks (Fig. 5).

The walls separating the rooms were constructed in the same way. It is probable that most of the wall planks served as floor planks when the house was to be renewed. A number of worked timbers showed rectangular holes, sometimes at regular intervals. They may have been part of a superstructure of which no further remains survive. No clear evidence for entrances was found.

From the fact that a cluster of posts had their bases outside the original wall row, it is concluded that it formed part of a partition wall. The side-ward movement must have pushed these posts completely out of position. But they caused a resistance to the post-occupation sinking, intensifying in this way the effect of the sinking of the room centers due to the weight of the hearths.

Parallel to the outer wall of the first house an elaborate structure was found, consisting of (1) a foot-path, mostly of planks, and (2) a wall, consisting of very heavy posts at intervals of $2\frac{1}{2}$ m, which retained heavy oak planks (three above each other)

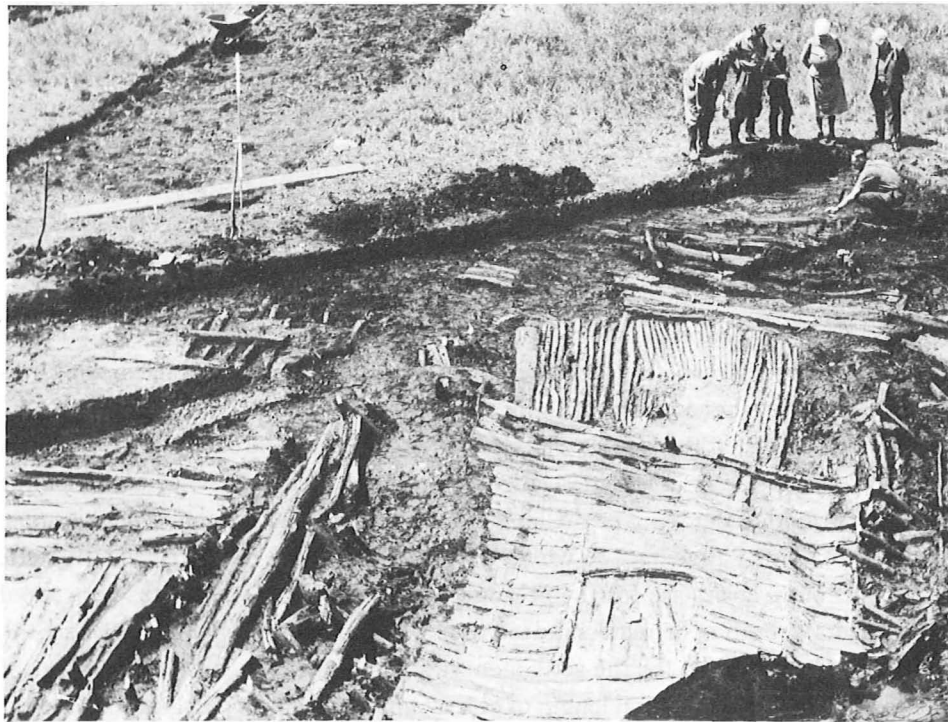


Fig. 4. Niederwil. Houses I and II with floor layers.

in position. These planks were at their outer side supported by a palisade of round timbers of normal size. Outside the palisade, another wall of planks and another palisade occurred locally.

The fence was followed for the full length of the first house; it was lying obliquely, but the proof that its original position was vertical was obtained at both house ends, where the fence turned bogwards. Time did not permit excavating it completely.

The complex character of the fence definitely points to a defensive function.

The zone between the settlement and the shore was examined by trial trenches. No indications were, however, found for a path-way leading to the settlement. Apart from the fact that the sinking of the floor masses may have had as a partial effect a lofting of the gyttja layers towards the shore, and thus a decay of the contemporary layers, it may well be that in view of the defensive character of the wall, we rather should have sought the entrance at one of the house ends.

The path-ways between the houses were formed by planks, either longitudinal or transversal, by round timbers, or by fascines. Sometimes timbers of the house substructures intercalated with these path layers and supported them.

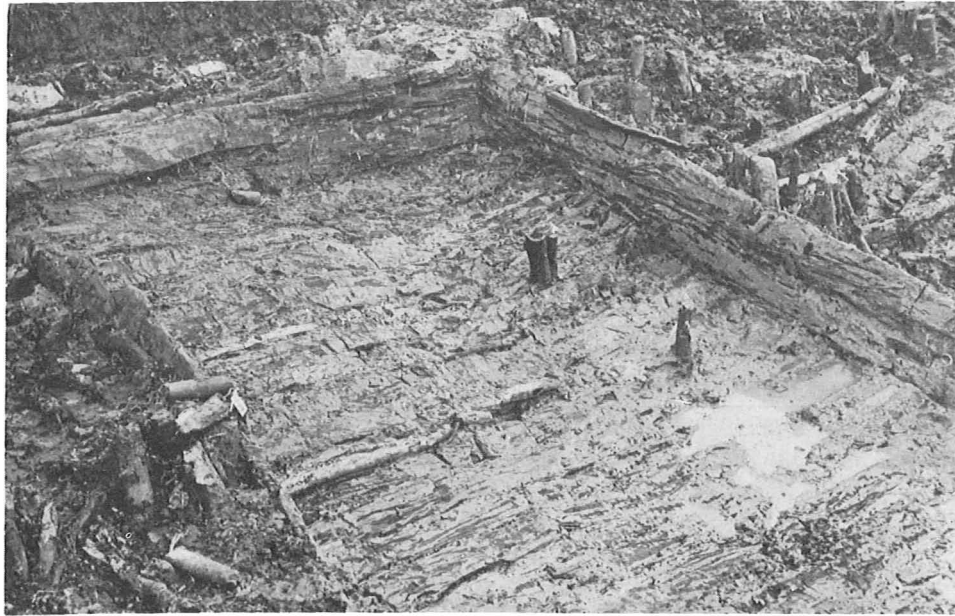


Fig. 5. Niederwil. Room at end of house I with lower part of walls preserved.

THE FINDS

Only the *pottery* of the 1962 campaign has been studied in some detail. Three varieties can be distinguished: a black burnished ware, a grey burnished ware and a grey roughened ware. The wares occur in changing proportions over the different pottery types.

The total number of rim sherds was 1032, the greater part of which could be attributed to a restricted number of types. Following Driehaus (1960) we obtained as tentative major groups and approximate percentages:

<i>Flaschen</i> (roughened)	2 %
<i>Flaschen</i> (burnished) (Fig. 7: 1)	5 %
<i>Henkelkrüge</i> (burnished) (Fig. 8: 4, 5, 8)	3 %
<i>Schüssel</i> (burnished) (Fig. 8: 1, 2, 3, 13, 14)	9 %
<i>Schalen</i> and <i>Kümpfe</i> (burnished) (Fig. 8: 9, 10, 11, 12)	4 %
<i>Becher</i> (burnished) (Fig. 7: 7, 8)	3 %
<i>Trichtertöpfe</i> (burnished) (Fig. 7: 2, 3, 4, 5)	18 %
<i>Trichtertöpfe</i> (roughened) (Fig. 6)	55 %
<i>Trichtertöpfe</i> (rusticated) (Fig. 7: 6)	1.5 %
Rectangular bowls (<i>Schmelztiegel</i>) (Fig. 8: 6)	0.3 %
Spoons (<i>Löffel</i>) (Fig. 8: 7)	0.3 %
<i>Backteller</i>	0.2 %
Small cup	0.1 %

The black burnished variety is only found with a small part of the *Flaschen* and with approximately half of the *Henkelkrüge*, *Schüssel* and *Schalen*.

Wall ornamentation is restricted to one *Schale* with *Stichreihen* and to a group of small *Trichtertöpfe* with finger-tip impressions over the whole surface.

Tupfenleisten (finger-tip impressions on the outer rim) occur only with the *Trichtertöpfe* (a quarter of the burnished and a third of the roughened variety).

Unperforated lugs, often in pairs, occur only 1. on the belly of app. 10% of the *Schüssel*, and 2. on the rim of *Trichtertöpfe* (more than half of the burnished and a sixth of the roughened variety).

The *battle-axes* (Fig. 9) belong to two types. There are 8 fragments of *Knaufhammeräxte*, very much like the famous one from Niederwil in the Zürich Museum, with slight asymmetry, lozenge-shaped section, and a groove on one or both sides. The other 8 belong to the group of *flache Hammeräxte*. On one axe the perforation failed; as stray finds two perforation cores were found.

The *stone axes* (Fig. 10) are all more or less thin-butted. Their size varies greatly. Characteristic is the always more or less rectangular section. They belong to a variety of rock types. No flint axes occur. The total number of axes is 120. Some axes showed clear sawing marks.

The *flint* industry is on the basis of blades, struck from a yellow-brown flint, turning to red when burnt. No cores were found. The number of worked flints exceeded that of seemingly useless flakes. Since the occupation layers never contained any small flint chips, we must assume that the flint working did not occur in the settlement itself. The following numbers occurred:

Arrowheads (Fig. 12: 1, 2):	10
Scrapers	
normal (Fig. 12: 3, 6):	26
with single knife edge (Fig. 11: 1):	19
with double knife edge:	6
double, with single knife:	1
edge pointed (Fig. 12: 2):	4
half-edged, with knife edge:	10
Knives	
unhafted, single (Fig. 12: 5):	27
ditto, pointed (Fig. 11: 6):	9
unhafted, double (Fig. 11: 4; 12: 4):	4
hafted (Fig. 11: 3, 5):	22
others (see scrapers):	36

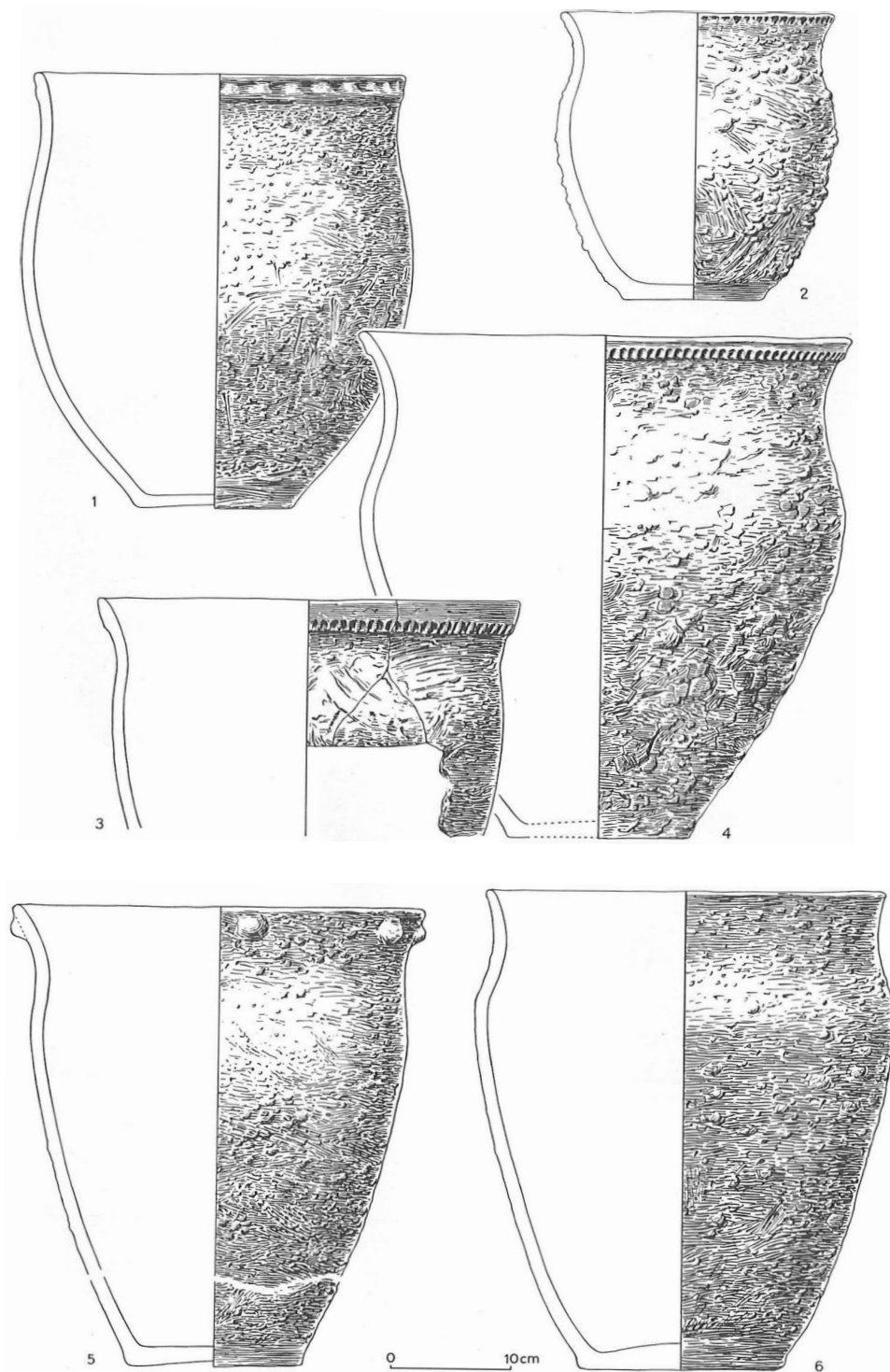


Fig. 6. Niederwil. Coarse pottery.

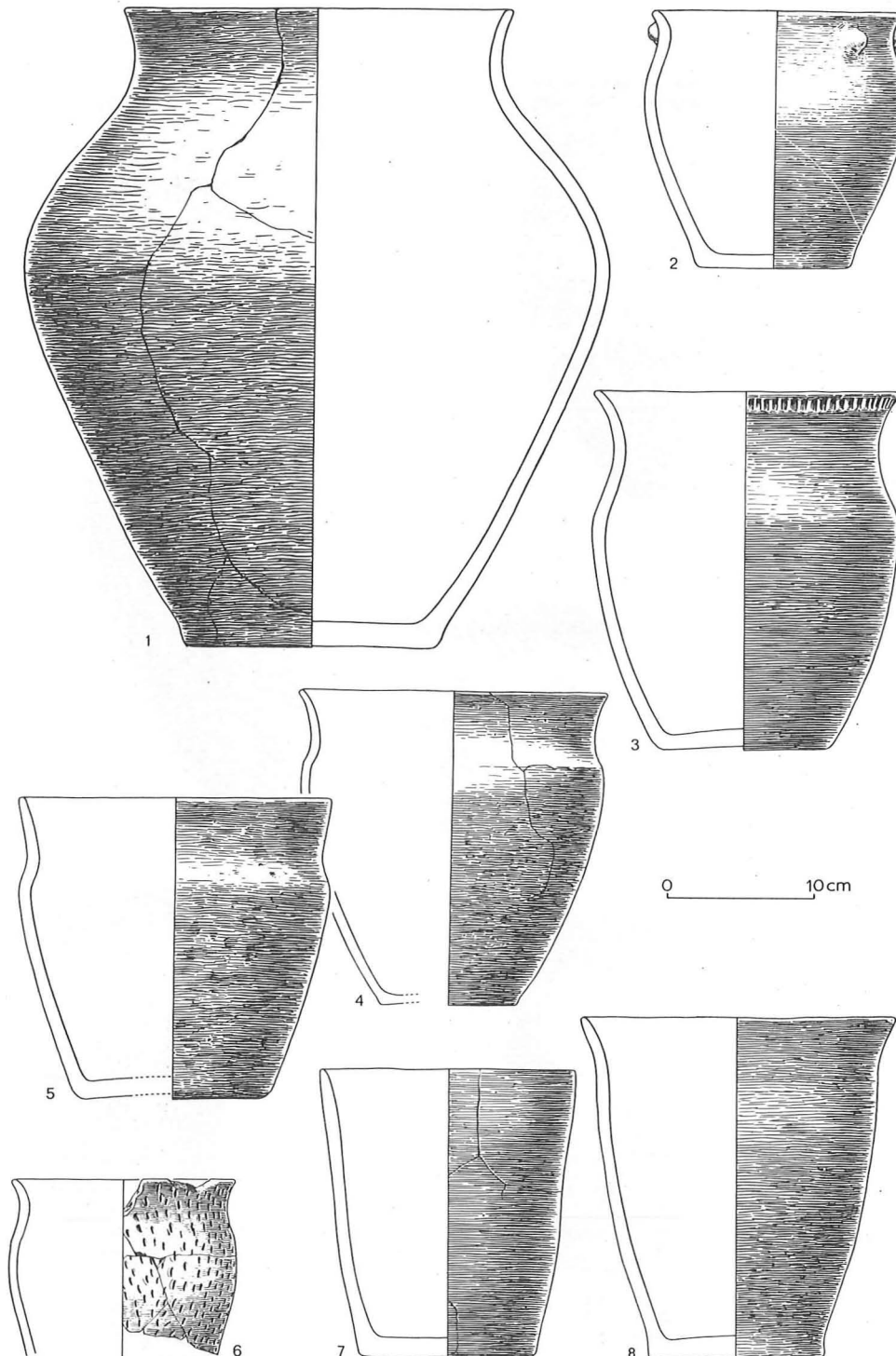


Fig. 7. Niederwil. Burnished pottery.

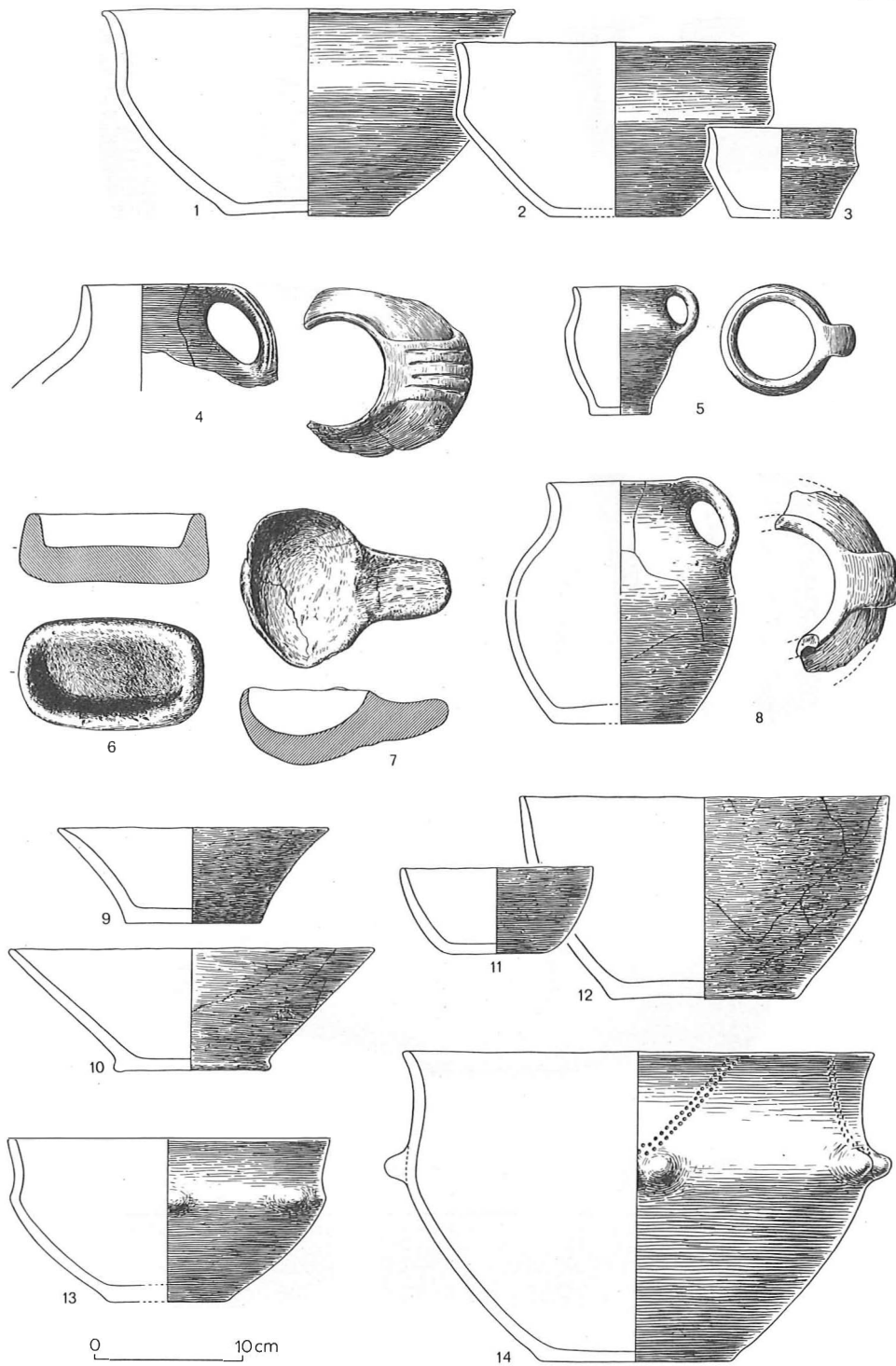


Fig. 8. Niederwil. Burnished pottery.

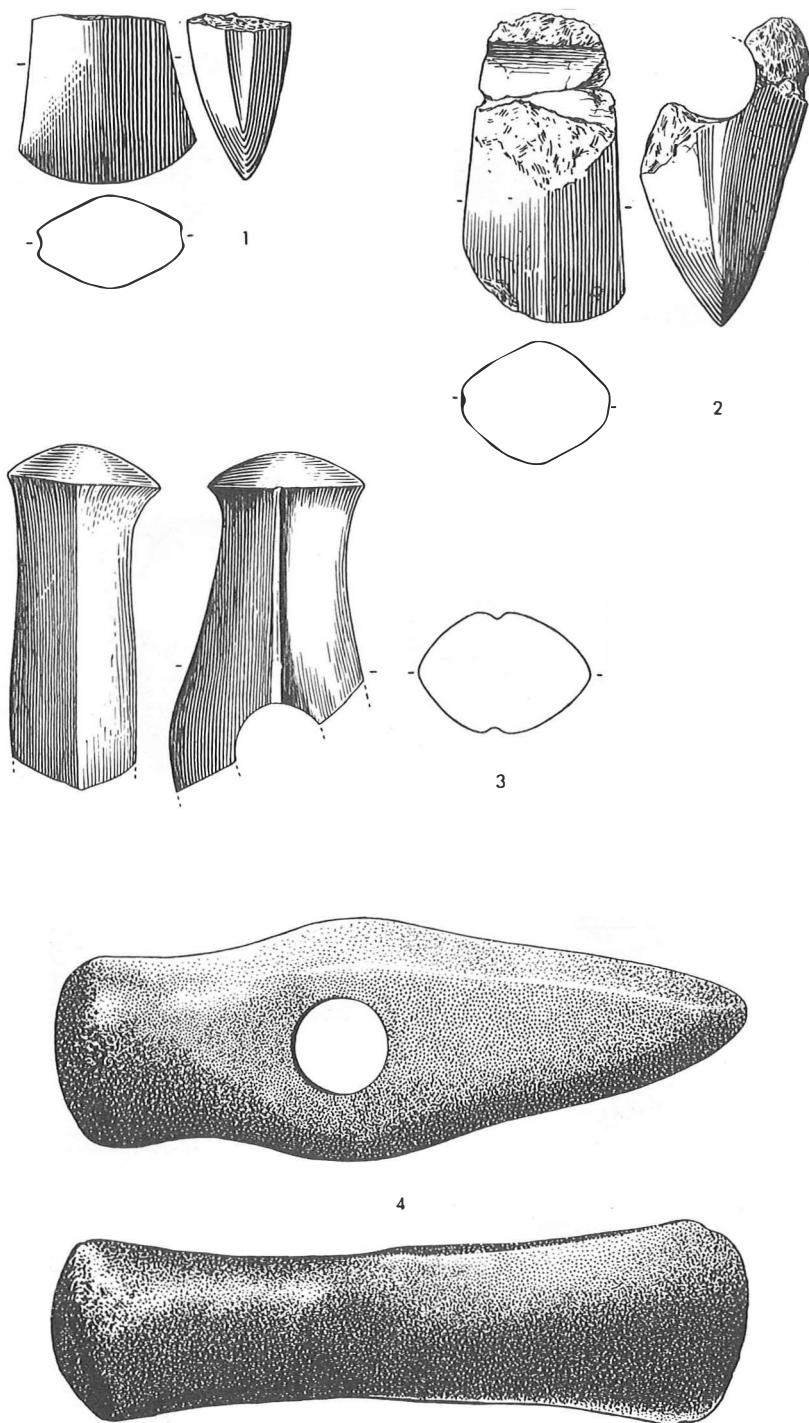


Fig. 9. Niederwil. Battle axes. Scale 1 : 2.

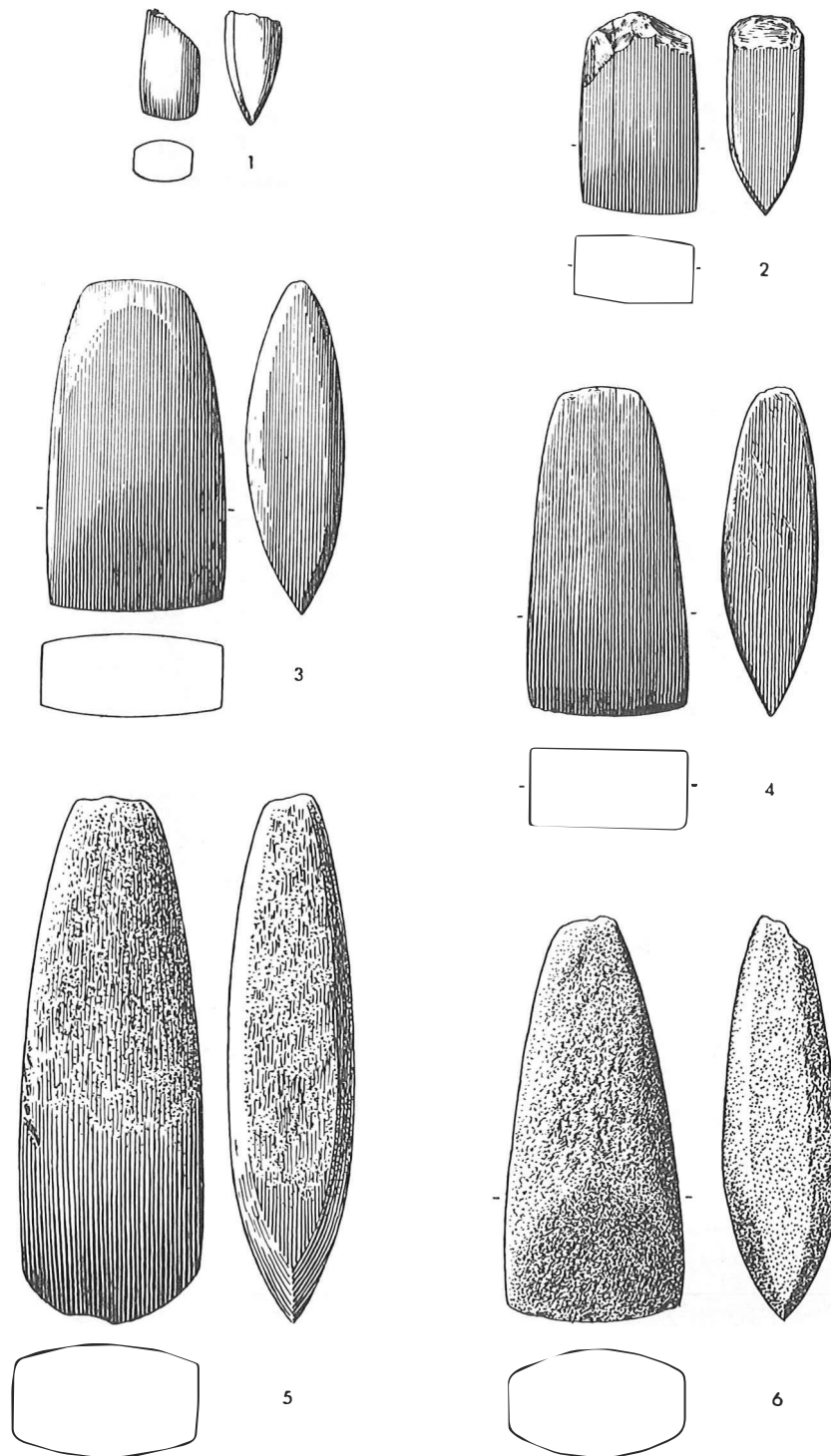


Fig. 10. Niederwil. Stone axes. Scale 1 : 2.

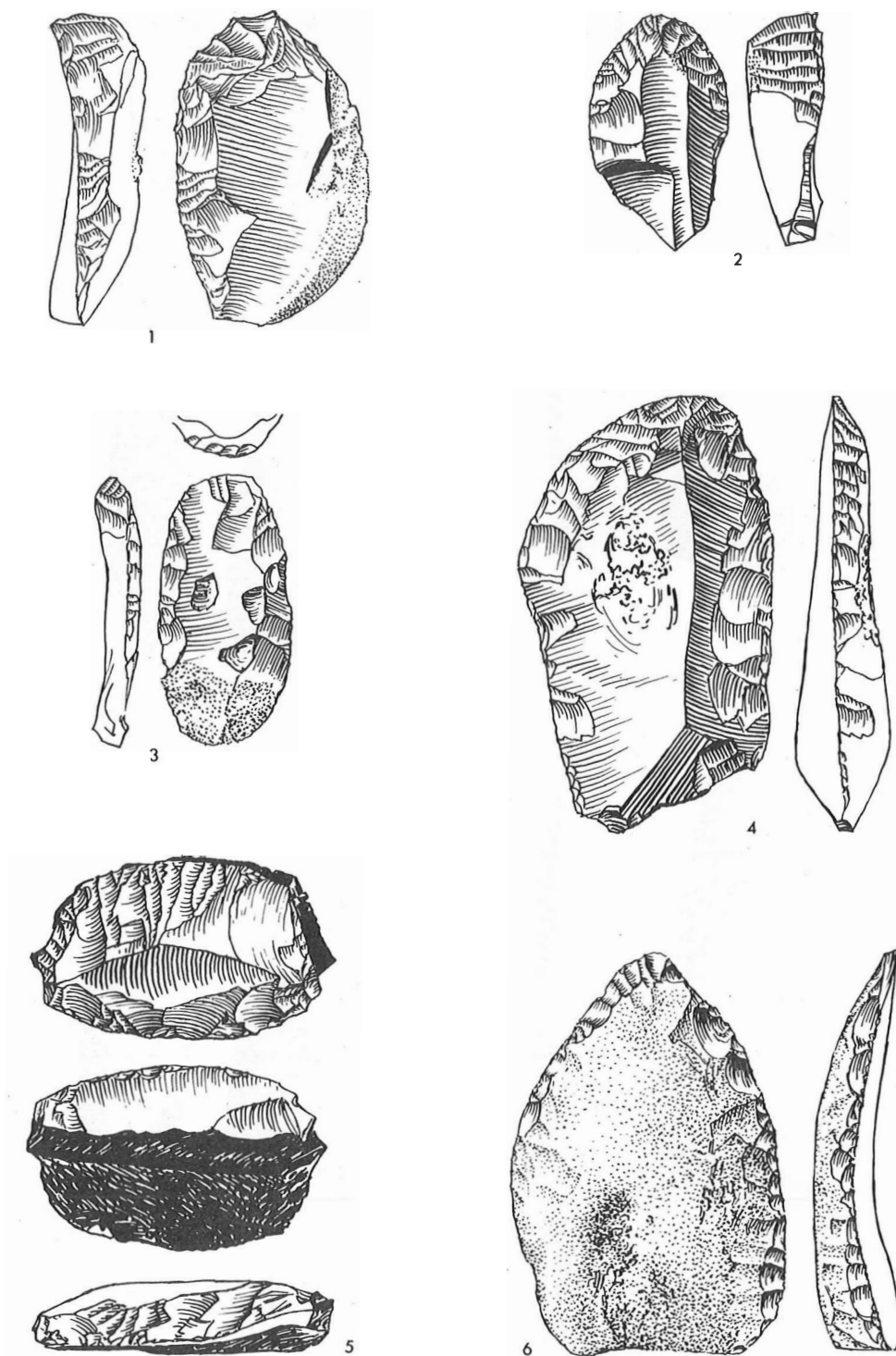


Fig. 11. Niederwil. Flint artefacts. Scale 1 : 1.



Fig. 12. Niederwil. Flint artefacts. Scale 1 : 1.

Blades

with retouch:	10
without retouch:	17
with retouch and sheen (Fig. 12: 7):	4

Flakes

with retouch:	12
others:	150

Broken artefacts: 16

Other worked flints: 16

The main types are scrapers and knives. Characteristic for the knives is the slightly asymmetrically curving edge. Those that have been hafted are recognized by the unequal wear, remains of birch pitch, by their sheen, and by a tendency towards surface retouch, also on the haft side. A small number (not included in the table) have been found with intact wooden hafts.

There seems to have been a particular preference for the combination of the steep scraper edge with a knife. The wear on these objects definitely shows their combined function.

Wooden objects will not be dealt with in this preliminary report. They comprise axe and adze shafts, knife handles, bowls and cups, a bow fragment, two dagger-like objects, *etc.*

No *metal* objects were found; among the older finds a copper ring is mentioned. After the excavation a small flat copper spiral was recovered from the excavation dump.

Textiles were few in number.

No obvious *ornaments* were found, but among the older finds a few tooth pendants exist.

For the *bone* objects, the reader is referred to the separate report by A. T. Clason, who also deals with the *faunal* remains.

BOTANICAL INVESTIGATION

Preliminary results can be given of the seed analysis (*cf.* Fig. 13). It has to be stressed that the number of analysed samples is still too small to provide a representative picture. Moreover, various seed types have not yet been identified up to the species level, and the preliminary identification of others needs confirmation.

As for cultivated plants, seeds of club wheat (*Triticum compactum*), common poppy

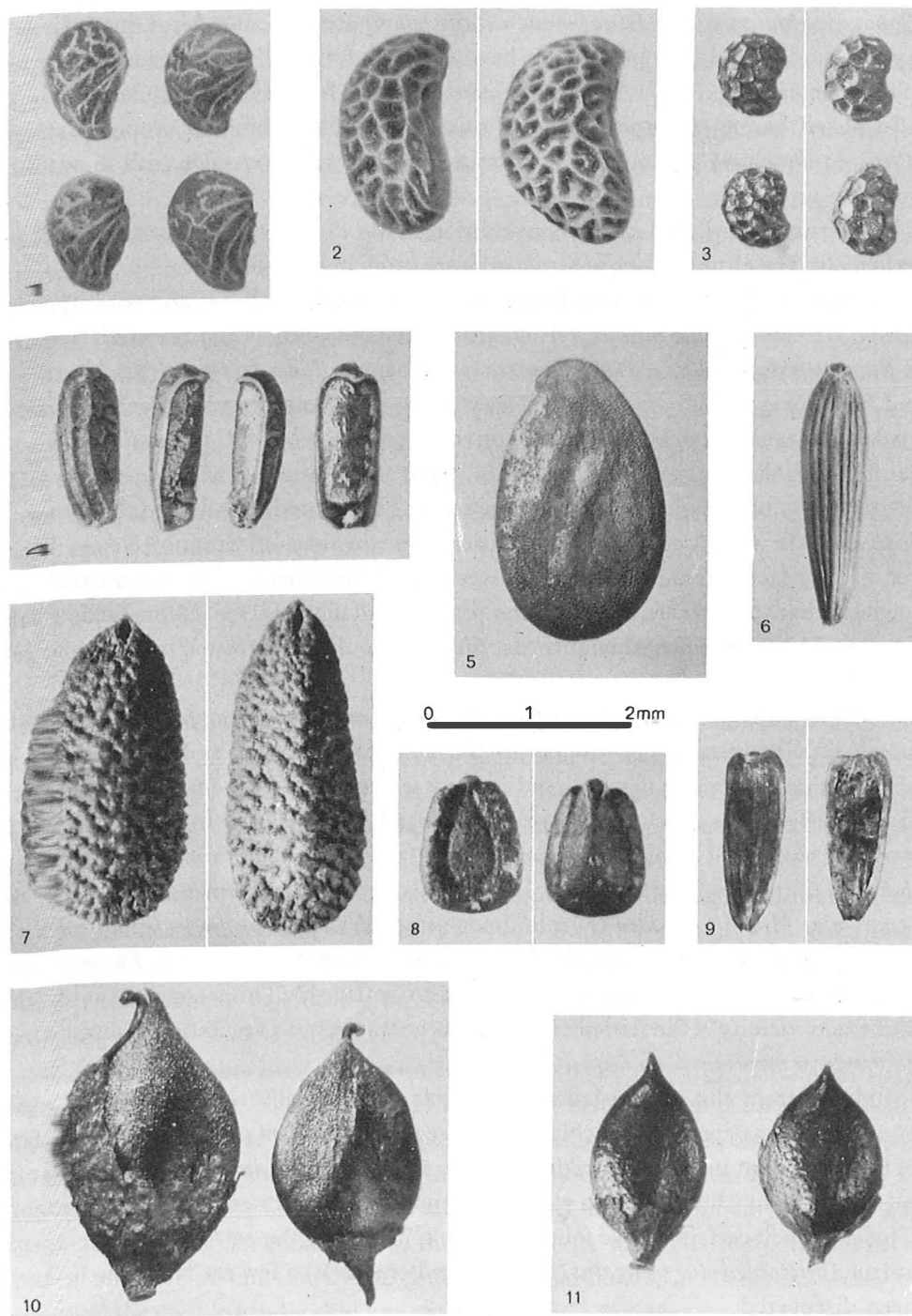


Fig. 13. Niederwil. Subfossil seeds. 1: *Fragaria vesca*; 2: *Rubus idaeus*; 3: *Papaver somniferum*; 4: *Verbena officinalis*; 5: *Linum usitatissimum*; 6: *Lapsana communis*; 7: *Sambucus nigra*; 8: *Lycopodium europaeus*; 9: *Achillea millefolium*; 10: *Polygonum hydropiper*; 11: *Polygonum persicaria*. Photo W.A. Casparie

Moravian Jevišovice C2, to form together a *Nordalpine Kreis* as Driehaus suggests, one could also include Schussenried and Mondsee.

The typical Niederwil battle-axe occurs both in Altheim and in Mondsee, the stone axes have an oval section in Altheim, but a rectangular one in Mondsee and Schussenried. The flint inventory seems to connect Pfyn with Schussenried; Altheim and Mondsee use tabular flint, unknown to Pfyn. The high frequency of arrowheads in Altheim is again found in Mondsee.

Altheim prefers a loess soil; Pfyn, Schussenried and Mondsee lake-sides and bogs. The eponymous site of Altheim has a three-fold ditch and a palisade of distinctly defensive character, surrounding an area of the same size as our Niederwil settlement, in which however no post-holes were found. The large quantity of finds in the ditches points to intensive habitation. Perhaps it consisted of houses of the same main type as those of Niederwil.

In any case, the TRB houses of Barkaer (Glob, 1949) are obvious parallels to the Niederwil long houses; a genetical connection is not impossible if one takes into consideration that the typical battle-axes of Niederwil have well-known counterparts in the Baltic area, and that Baalberg is seen by many investigators as related to or even part of the TRB-complex. As a further parallel to the long houses of Niederwil the Tripolye houses may be mentioned.

In view of the close relationships of Pfyn in northern, northeastern and eastern direction, the difference with the (also on tree-ring evidence) largely contemporary Younger Cortaillod culture (von Gonzenbach, 1949) is striking. Neither the occurrence of a battle-axe fragment in the easternmost site of Younger Cortaillod (Seematte) nor the presence of paired lugs not unlike those from Cortaillod, in the Pfyn group affect this observation. The *flûte de pan* and other lug types, the round bottom, the broad flattened bowl rim, the birch-bark ornamentation, the frequent occurrence of pendants are typical Cortaillod features.

On the other hand, there is the same preference for lake-sides and bogs and – apart from differences in details – a fair amount of agreement in flint, bone and wood industry.

The scene is complicated by a further contemporary culture, Michelsberg. At Thayngen it influences Pfyn, in different Cortaillod settlements it manifests itself in pottery forms, ornamentation, *etc.* It also shows its influence in the Schussenried settlement of Ehrenstein near Ulm.

SOME SPECULATIONS

Apparently we are faced with a number of different contemporaneous groups and the nature of their origin and interrelations presents a fascinating problem.

Pfyn and Altheim are as closely related as two cultures possibly can be, but their

ecology is totally different. On the other hand Cortaillod and Pfyn are very different in pottery, but they prefer the same environment, which is, of course, a cultural trait as well.

Pfyn and Altheim clearly belong to an eastern tradition, going ultimately back to the Balkan Copper Age, Cortaillod belongs to the western tradition. But what explains the common preference of Pfyn and Cortaillod for the same type of environment? Perhaps we may think of an earlier population, culturally much less differentiated, which had already adapted itself to the bog and lake-side environment. Groups belonging to or related to the Rössen culture may be thought of in this respect.

In any case we must reckon with two main centres, nuclear areas, from which strong influences radiate both in economic and stylistic aspects, *e.g.* a fairly well localized southeastern and a much less localized western. These influences can be held responsible for the observed relationships. They may mask important genetic differences between groups, but on the other hand, they may lead a fairly homogeneous stock to differentiate in two directions. Finally a certain group may in some aspects have undergone influences from one centre, in other aspects influences from another.

A case in point would be the northern TRB groups, which on the base of pottery, battle-axes, and house types would be of southeastern affinity, but whose megaliths are clearly of western origin. The Michelsberg culture may be another, though less clear instance.

If we do accept long-distance influences in the problem of the origin of the different megalithic groups, why should we not do the same in other sectors of human culture? As Driehaus has pointed out, the Balkan Copper Age is of paramount importance for the establishment of his *Nordalpine Kreis*. Apart from the use of copper there must have been many other innovations with a strong capacity to be diffused which led to the establishment of a large number of regionally differentiated sessile village farming groups flourishing alongside each other for a considerable time.

In absolute chronology this system would have originated between 3900 (radiocarbon dates for Herpály and Hamangia) and 3500 B.C. (radiocarbon dates for Sălcuța, Gumelnita and Cucuteni A). Now that Georgiev (1961) has shown that nearly the whole of his 12 meters of deposits at Karanovo precedes Troy I, and that many supposedly Aegean or Anatolian Bronze Age traits occurring in Balkan Copper Age cultures can in fact be reversed, there need no longer be a discrepancy between radiocarbon and „historical” dating in southeastern Europe. Which again would emphasize the importance of the Balkan area as a centre of diffusion – ultimately even for Atlantic Europe.

[Revised December, 1966.]

ACKNOWLEDGEMENTS

The excavation took place in 1962 and 1963 on the request of the Thurgau Museum. The cantonal government and the Swiss National Foundation gave considerable financial support. We gratefully acknowledge the cooperation with Dr. B. Meyer and Mr. K. Keller-Tarnuzzer.

Permanent members of the team were Messrs. H. Praamstra and A. Meijer of the Biologisch-Archaeologisch Instituut. During the 1963 campaign Dr. J. J. Butler, Dr. J. D. van der Waals, Dr. W. A. van Es, Dr. A. T. Clason, Mr. O. H. Harsema, Mr. S. Bottema, Mr. W. A. Casparie, Mrs. J. N. Swart-Poelman, and Mr. J. W. Boersma of the B.A.I. joined the excavation for some weeks each.

A first note on the excavation has been published by O. H. Harsema (1964).

The final report of the excavation will include contributions by Dr. A. T. Clason (animal remains), Mr. J. Schweingruber (wood identification), Dr. H. J. Müller-Beck (wooden objects), Dr. H. J. Hundt (textile remains), Dr. V. Munaut (dendrochronology), Dr. J. M. Matthews (palynology) and others.

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