

Sarup

Two Neolithic Enclosures in South-West Funen

by NIELS H. ANDERSEN

INTRODUCTION

In 1971–84 two neolithic causewayed camps dating from the latter half of the 4th millenium B.C. were excavated near the village of Sarup in southwestern Funen. The older and larger of them enclosed an area of about 9 ha., making it one of the largest ancient monuments in Denmark. The Sarup camps were the first of their kind to be recognized in this country, but subsequently a dozen more have been found, and the type is familiar especially in Germany, England, and France.

TOPOGRAPHY

The site is situated on a sandy promontory in the outlying eastern part of the village of Sarup. This promontory has an area of about 9 ha. and rises about 9 m over two streams, which bound it on two sides (fig. 2). The

streams meet at the southern extremity of the site and continue southwards about 2 km to Helnæs Bay. On the east and north the site is level with the surrounding land, and it is here that the enclosure systems were placed.

THE EXCAVATIONS

The neolithic features survive as the soil marks of palisades, enclosures, isolated fences, and ditches. Inside it were found a large number of pits – especially from later settlement phases. Many years ploughing of the site made it an acceptable policy to remove the topsoil with earth-moving machinery. It was possible to expose and excavate about 1500 m² a week. All postholes and pits were totally excavated and most of the ditches and palisade trenches were examined by means of 1 m wide cross trenches. Sieving and flotation were carried out

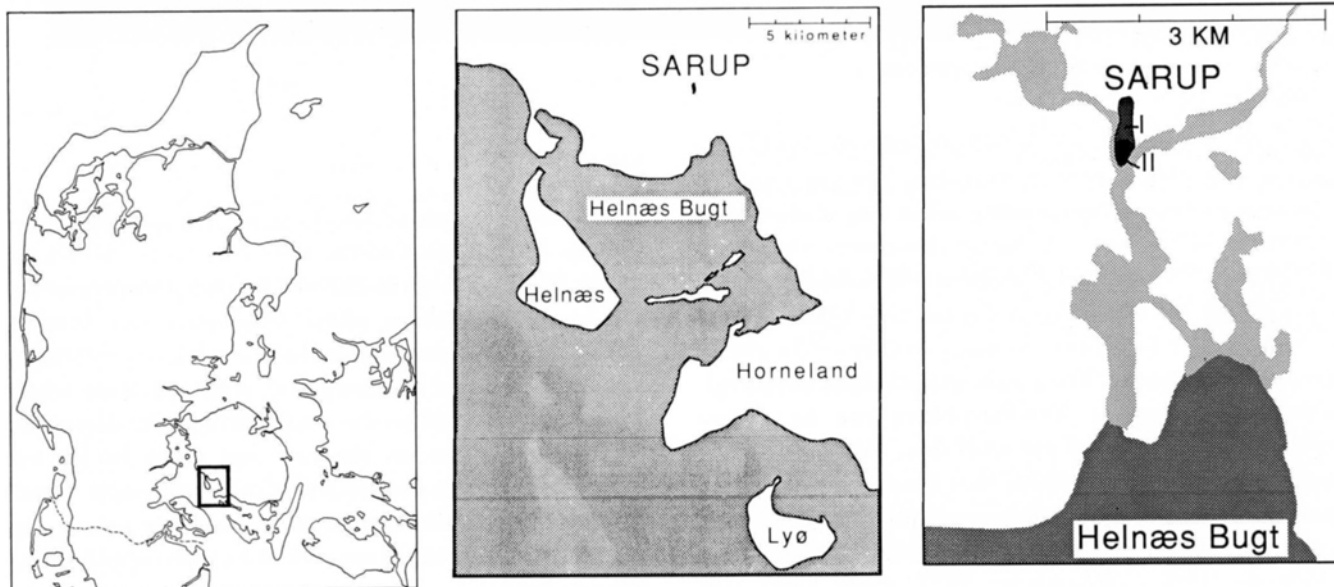


Fig. 1. Position of Sarup in western Funen.



Fig. 2. Sarup from the air, looking northwards.

regularly to obtain as much carbonised wood and seeds as possible with a view to revealing the surrounding natural conditions and finding what was gathered or cultivated at the time. At Sarup there were excavated 3228 features with finds and about 6000 without, and a total of 238,585 objects were found. One would expect to find three or four times as many features if the entire site were excavated. The whole material has been registered on computer. Eleven phases can be distinguished, of which five are neolithic, two with causewayed camps. As it is these that have given the most new information, they will be examined in greater detail under the names SARUP I and SARUP II (see also Andersen 1974, 1975a+b+c, 1977, 1980, 1982, and 1988).

SARUP I

This was the largest and earliest, covering an area of 8.5 ha (fig. 3) and dated to ca. 3400 B.C. (carbon-14 from grain, 2630 ± 70 bc, K-2828). The camp was constructed in the Fuchsberg phase (Andersen and Madsen 1977) at the transition from the Danish Early to Middle Neolithic. Shaped as a long oval, it occupied the whole headland, bounded on the south and west by slopes and watercourses, and on the east and north by the enclosure. This latter consisted of the foundation trench of a palisade, fenced enclosures and other fences, entrances, and a double row of ditches interrupted by numerous causeways.

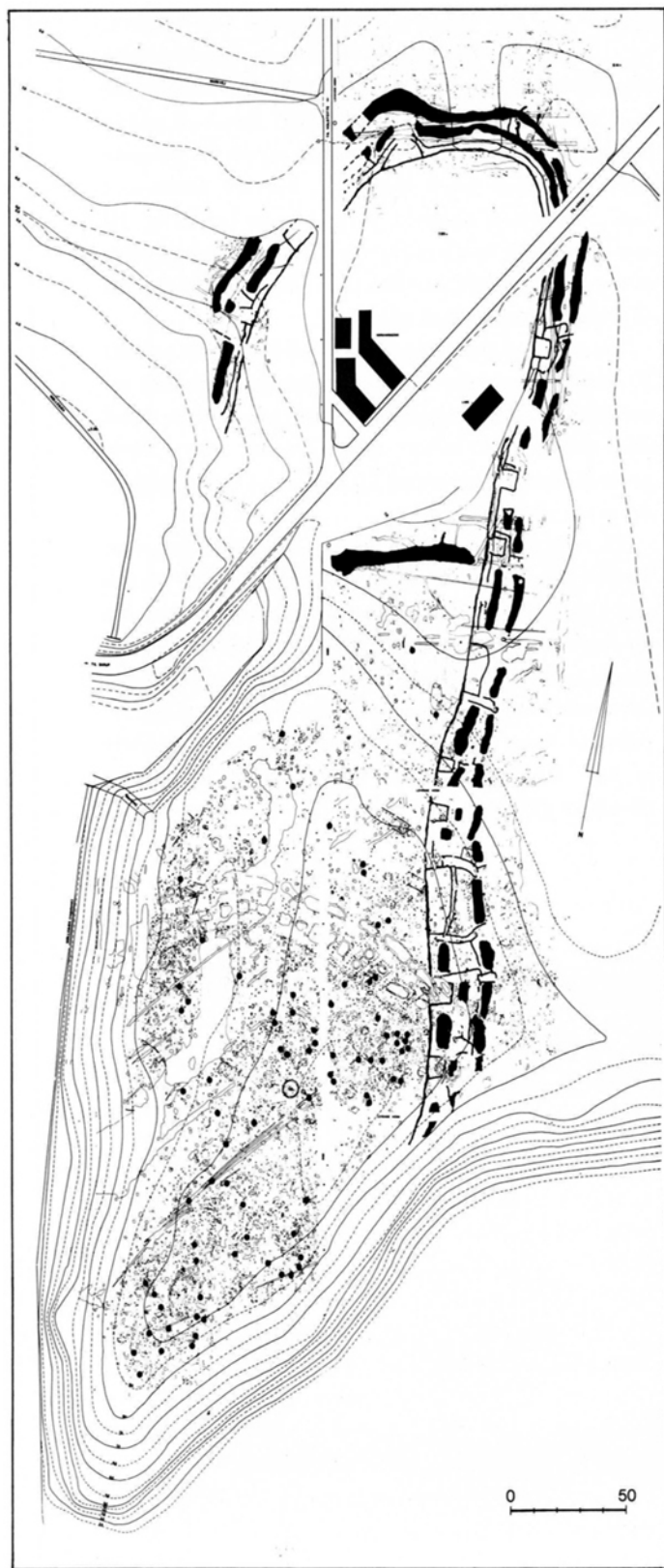


Fig. 3. Sarup I shown black, dots indicate ritual pits.

The palisade

This stood in a trench 40–130 cm wide and 50–110 cm deep, which could be followed for a distance of 572 m. The trench had vertical sides and flat bottom (fig. 4). The palisade planks, which stood in it with about 65 cm from the centre of one post to the centre of the next, were for the most part turned to soil and appeared only as dark patches in a horizontal surface, but in the damp northern area, where the ground water was high, they were still preserved as wood. Those surviving were split oaken trunks with diameters of up to 42 cm. On their lower ends were clear marks of cutting with an axe (Andersen 1980, 87), applied at an angle of 30°–45° to the direction of the trunk.

The decayed post moulds could be studied in ten vertical sections. In eight the post stood in the centre of the trench, and in two at its side against the edge of the trench. Naturally it was intended that the posts should stand vertical, but it could be seen that before finally decaying they inclined outwards or inwards. If a bank had abutted against one side of the palisade, they would all have inclined in one direction, away from it. If there had been banks on both sides of the palisade they would have remained vertical. One must therefore suppose that there had been no bank at all. The varying inclinations suggest that the palisade was not maintained and righted up to a vertical position before the earth had consolidated around the posts. None of the palisade posts had been removed and all had decayed in place.

In the fill and especially at the surface of the palisade trench there were found 2261 objects (of which 85% were potsherds) in the 81 meters that were excavated. In some places there were concentrations of pottery near where the posts had stood, indicating that complete pots had been deposited deliberately. One should imagine a palisade of oak planks up to 42 cm wide rising probably 2–3 meters above the ground. Beside the palisade were placed various objects, some of them complete pots, clearly selected material. The palisade seems quickly to have become unfunctional, but it was not removed. It was big enough to have served as a defensive work, but none of the objects found looked like the remains of battles, but were more suggestive of ritual acts. Nevertheless the palisade must originally

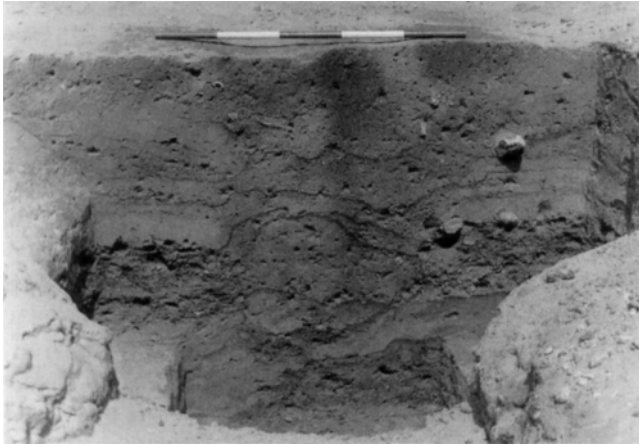


Fig. 4. Section across palisade trench of Sarup I.

have been an impressive sight, whose purpose must have been to call attention to something or other. It was also the structure which the other features followed, and they must all have been constructed at the same time according to a detailed design.

Enclosures

A characteristic feature of Sarup were the 19 enclosures joined to the palisade or placed in the gaps between the ditches. Those joined to the palisade followed a se-

quence like two squares, a rectangular, two squares, etc. (see fig. 3). The square enclosures ranged in size from 32 m² to 76 m² (figs. 5, 6C, 7A), the rectangular ones from 145 m² to 255 m² (fig. 6D). Between and in front of them and at varying distances from the palisade were unaligned ditch segments. Further enclosures were sometimes attached to their outer sides (fig. 7B and C). On the north of the site there was an enclosure in the form of two arcs – like crab claws – with two sets of ditches outside them (fig. 8).

The posts of the enclosures stood in trenches about 50 cm deep and were shaped sometimes as planks, sometimes as round timbers. In some places they stood close together, in others about a meter apart. Their probable height was about 1.5 m – about half as high as the posts of the palisade.

There is nothing to suggest that the enclosures were roofed. In a few cases only there was a gap in the trench as a sign where there had been an entrance. There are no finds that reveal the function of the enclosures. However they must have had some special significance as several times ditches respect their placing along the palisade. Some other European monuments, especially in the Rhineland, have very similar enclosures (Boelicke 1977 and Lehner 1910).

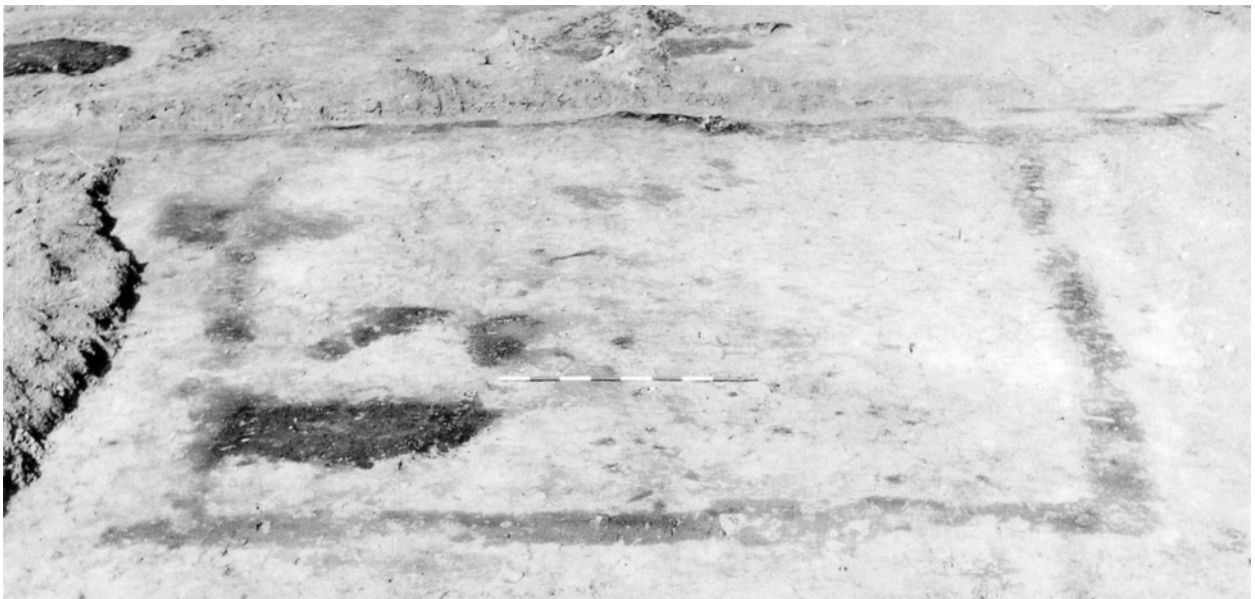


Fig. 5. Photograph of square enclosure (fig. 6C), with the palisade trench in the background.

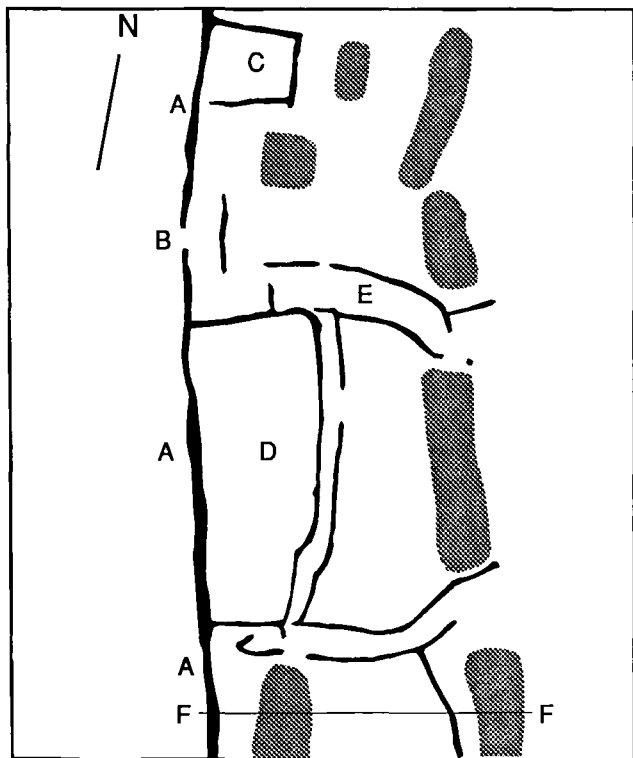


Fig. 6. Plan of area near entrance. A = palisade trench, B = entrance, C = square enclosure (see fig. 5), D = rectangular enclosure, E = fenced entrance passage, F = position of section fig. 12A.

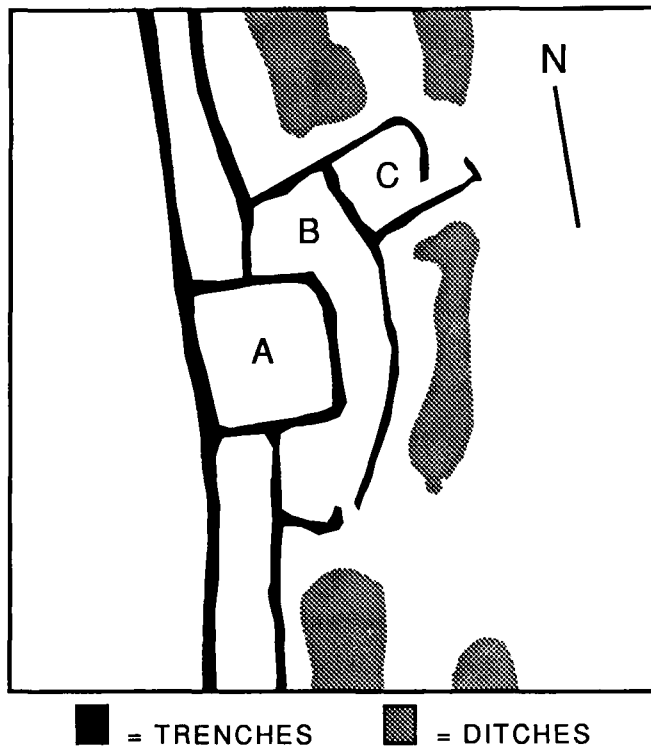


Fig. 7. Plan of the area with square enclosure with additional enclosure on its outer side. A = square enclosure, B = enclosure on outside of B, C = enclosure added to B.

Fences

Between the palisade with enclosures and the ditches were a series of trenches for further fences, some of which ran parallel with the palisade and others at right angles to it, leading to the area between the ditches (fig. 3 and 6). As they were only 20–50 cm deep, it seems that they can only have held short posts.

It is difficult to say anything about the function of these fences, but it may have been to show ways of access and delimit/separate areas within the camp.

Entrances

There are various gaps in the many fences, which are interpreted here as entrances. In the palisade there were two entrances, of which one is interpreted as the main

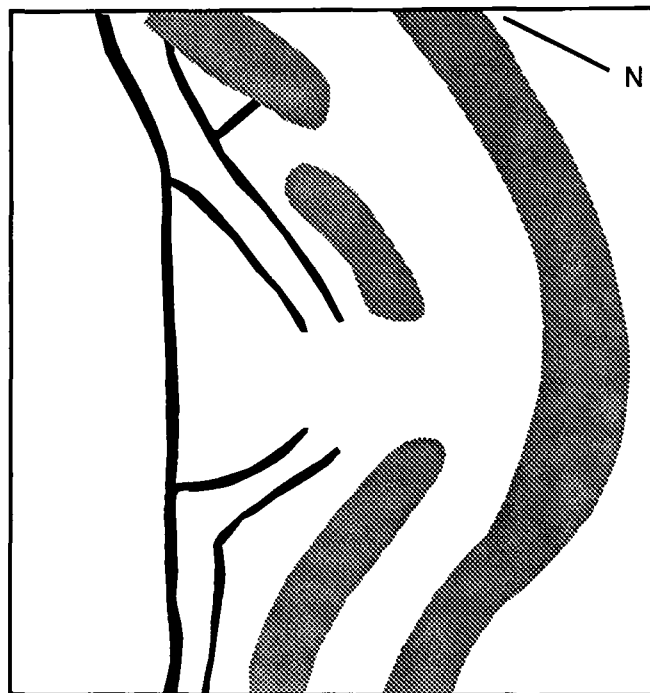


Fig. 8. The most northerly part of Sarup I with the "crab claws" expansion.



Fig. 9. Uncovered ditch of Sarup I with a later occupation layer.

entrance, while the other only led into an enclosure. The main entrance was a 1.6 m wide gap in the palisade (fig. 6B), placed about half way between the southern extremity of the sandy headland and the most northerly point of the enclosure – 300 m and 293 m respectively. It was shielded by a fence 6.5 m long standing about 3 m in front of it. Access to the entrance was along a 2–3.5 m wide path sheltered on both sides by fences, and at one place restricted by a crossfence to only 1.4 m, so nothing wider could come in.

It is remarkable that there should have been so small an entrance to an area measuring 8.5 ha! If there were many people at the site (and there is room for thousands) one would expect many entrances, or traces of a great deal of traffic at the only one, but this was not the case. No traces were seen at the main entrance of special activities, such as pottery offerings, etc.

Causeways

Outside the palisade ran two systems of ditches, which were not continuous, but were divided into sections by

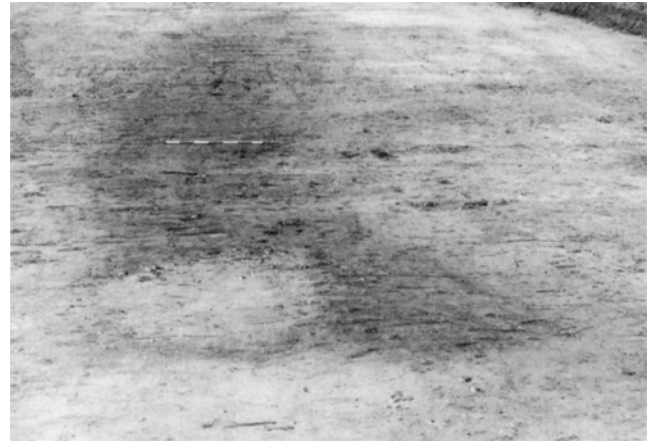


Fig. 10. Uncovered ditch of Sarup I with unexcavated block at one end.

causeways of untouched natural deposit (fig. 3). The width of the causeways varied from a few centimeters to 13.5 m, average 5.4 m. The causeways give many ways of access, but fences and the palisade hindered further progress.

Banks

There is nothing to show that the site was fortified with banks. Examination of the ditch fills indicates that they had been refilled manually shortly after being made. It can be seen that the fill came from both sides, so the up-cast must have been placed along both sides of the ditches. The variable depth of the ditches does not suggest that they were dug to provide earth for a bank, and two ditches had unexcavated blocks at one end (fig. 10).

Ditches

These were regular excavations with parallel sides and width at top of at least 2 m (average 4 m); lengths were from 5 to over 100 m, most frequently however around

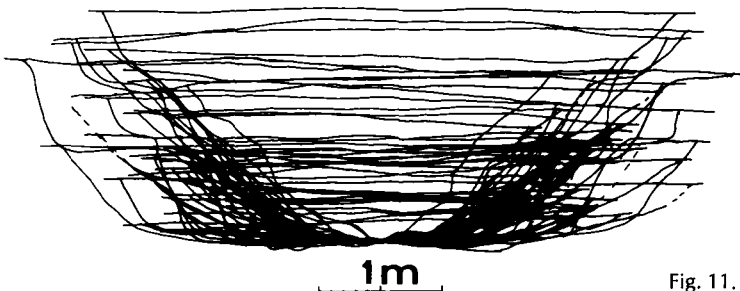


Fig. 11. Superimposed ditch profiles from Sarup I.

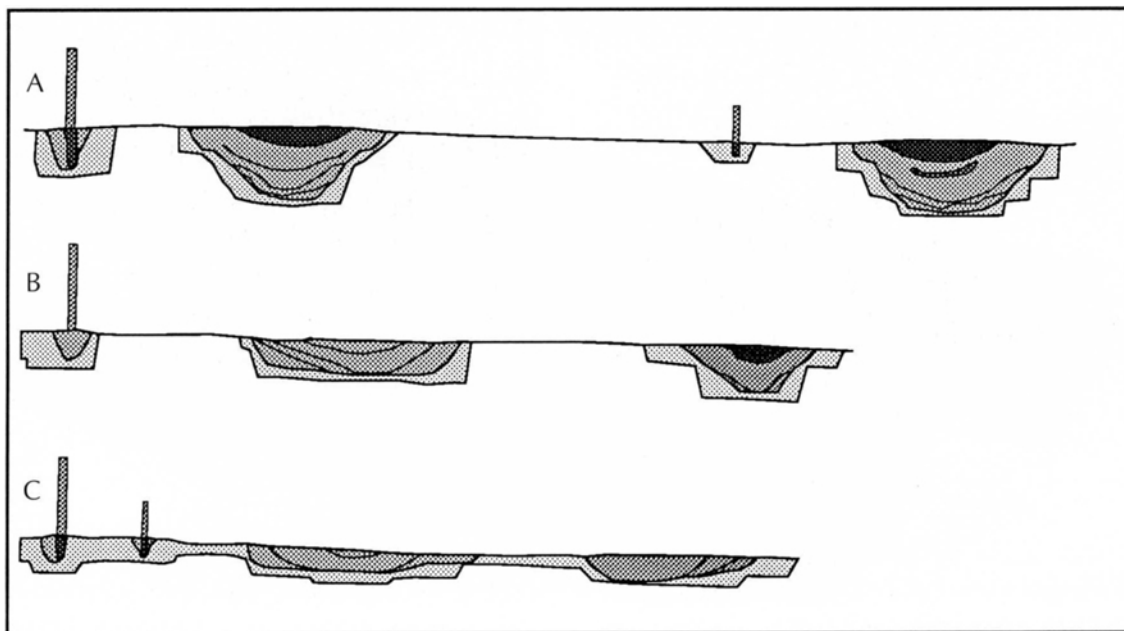


Fig. 12. Section through the palisade trench, two ditch segments, and a fence in the area south of the entrance (position shown in fig. 6F).

15 m, and depths were from 16 cm to almost 2 m, average around 1 m. The ditches lay in line separated by causeways. At Sarup there were two parallel rows of ditches (fig. 3), of which the inner one, which was nearest the palisade, followed a somewhat irregular course along the palisade and enclosures, while the outer one was more continuous. In the northern part of the site the ditches are less broken up by causeways, and one of them attained a length of over 100 m.

Forty-three ditch segments with a combined length of 608 m are recorded as being from Sarup I. Six have been more or less completely excavated, while trenches 1 meter or more wide have cases re-used. The superposition of all the drawn sections (fig. 11) showed that most had a flat bottom approximately 2 m wide (only two are pointed). Their depth varied from 16 cm to nearly 2 meters, average 83 cm. The deep segments are in the south, the shallow ones in the north, where ground-water probably also in the Stone Age prevented deeper digging. The angle between the flat bottom and the sides was 110° – 120° . Longitudinally they always had a horizontal flat base. If their purpose had been to provide earth (as for a rampart) it is unlikely that a horizontal flat base would have been aimed at or that the different segments would have differed so much in depth.

Examination of the inner and outer ditch segments in pairs (fig. 12) shows that the one closest to the palisade was often deeper and larger than the one further away.

It was sometimes possible to see traces of the original digging of the ditches in the form of steplike notches into the stratified natural sand and gravel. The depth of such notches was about 10 cm, no doubt the length of the blade of the digging implement.

In the northern part of the site the high level of the water table made the ditches damp and the fill correspondingly more peaty. There was no sign that water ever stood in the southerly ditches. In these there were only fine thin layers of sand that had blown and slid from the steep sides. There were no occupation or turf layers at the bottom of the ditches, which would have shown that they had remained open for some time and rubbish had been thrown into them.

In four cases at the bottoms of the ditches there were found animal bones and large pieces of pot, not ordinary settlement waste like small potsherds and flint chipping waste. In seven ditches concentrated layers of charcoal were found on or close above the bottom. Sometimes the surrounding earth was fire-reddened, which shows that the charcoal was burning or smouldering when buried.

At some places it could be seen that the sides of the

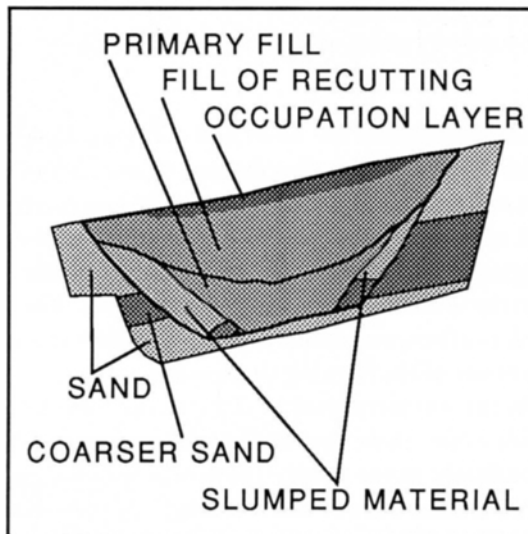


Fig. 13. Ditch of Sarup I with slumped layers at the sides.

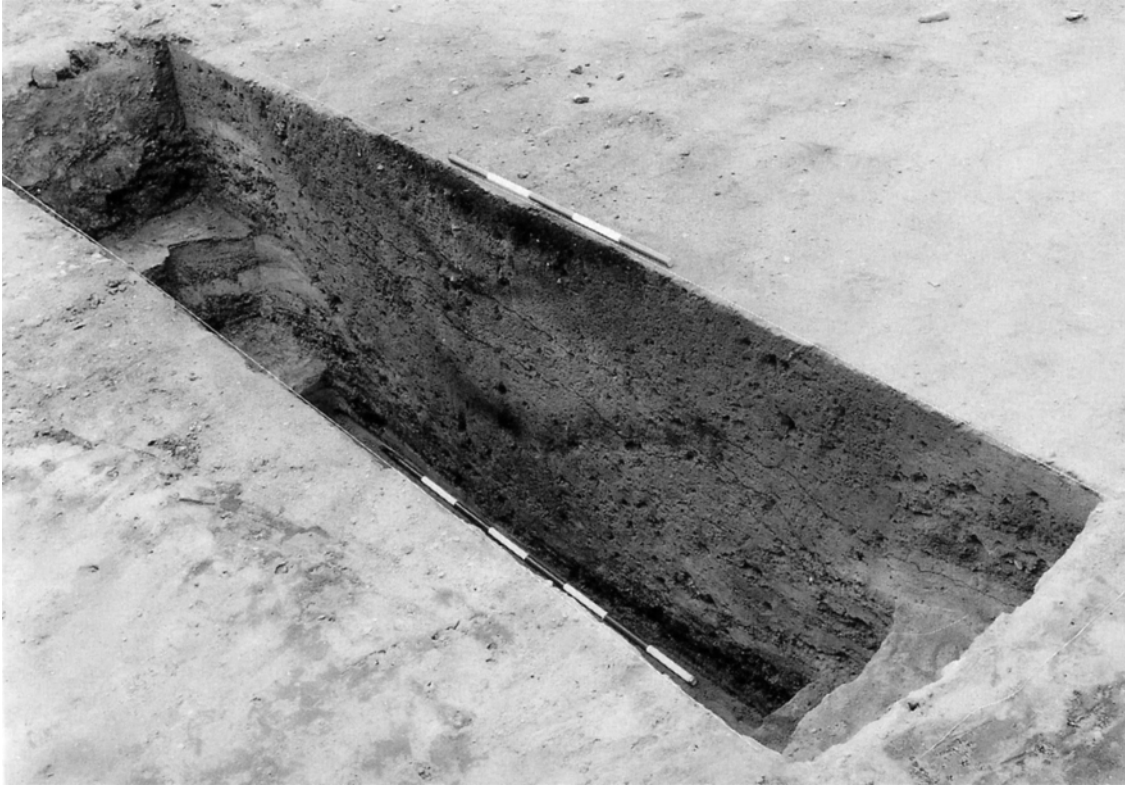


Fig. 14. Human jaw in ditch of Sarup I.

ditches had quickly collapsed, because lumps of the natural subsoil lay on the ditch floor (fig. 13). Collapse of the sides can occur very quickly, happening at latest when there is frost and thaw. Constructing the Sarup camp must have given the inhabitants many problems, but they made no attempt to keep the flat-based ditches clean.

From the deep layers in the ditches were recovered a total of 1343 finds, and they can be dated to the Fuchsberg phase. Only 210 of them were found in the south-

ern ditches. Compared with the number found in the palisade trench (2261), the number found in the ditches is small, for six times as much earth was dug out of the them as out of the palisade trench. Those found at the bottoms of the ditches appear to have been placed there deliberately. There were animal bones and large sherds, in some cases covered by layers of stones. Especially in the northern part of the site the number of implements was large compared with the number of flakes. The average for the whole site was 14 pieces of



flint waste for each tool, but in the northern part there were only 3 pieces of waste for each tool! A use-wear analysis shows that these tools had been used primarily to work wood, but also hide and bone had been worked. There was a further tendency for tools used to work different materials to be found in different places. Another thing is that the sherds sometimes lay in separate heaps, as though representing single vessels broken at the spot (unfortunately preservation was very poor in the damp northern ditches).

It was a surprise to find human bones in the southerly part of the site. There was the mandible of an adult aged 25–30 years (fig. 14) and all the teeth of an 8–10 year child with traces of the skull preserved only as a dark decayed mass. The human bones did not lie together with other finds, and show only that also at Sarup there were performed acts connected with a skull cult, a thing which is well documented at certain comparable sites with optimal conditions for the survival of bones (e.g. Boujot 1985 and Mercer 1980).

Above the basal layers came a homogeneous fill made through the mixing of the earth that had originally been dug out. The fill is without internal stratification and

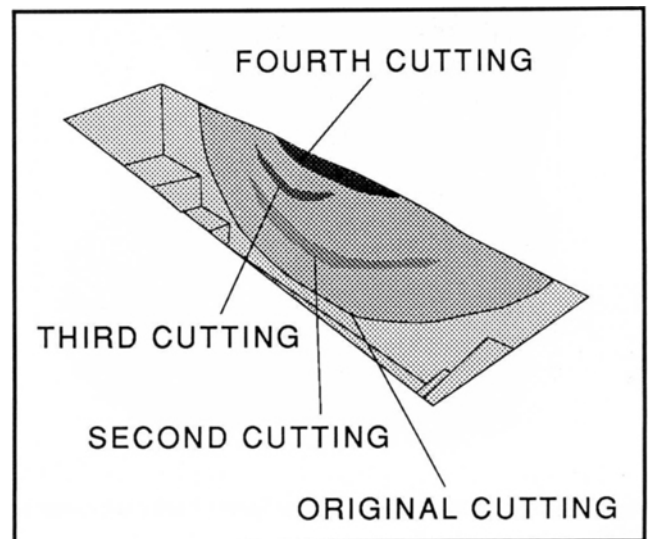


Fig. 15. Ditch of Sarup I with indications of having been recut and refilled three times.

must have been thrown back deliberately from spoil heaps on the sides of the ditch.

Recutting of the ditch was observed in in the fills of more than half of these features, all in the southern part



Fig. 16. Funnel beaker from the interior of Sarup I, containing further pots and carbonised grain. a-c: The three pots after reconstruction. a) 1:5. b) 1:2. c) 1:2.

of the site. The signs of recutting are sometimes hard to recognize (fig. 15), but show that it took place on several occasions – sometimes in the phase in which the camp was constructed, sometimes in later phases. All but one of the recuttings respect the basal level previously dug down to. Recutting was not established as

contemporary in all the ditch segments, in fact not even in adjacent segments. It was clearly done on special occasions and with particular aims in view. Finds were made in only a few recuttings and were of the same kinds as found at the original bottoms of the ditches. In one of the recuttings lay the sherds of a complete funnel

beaker. It was the many recuttings and the finds made in them that made it possible to distinguish the sequence of the neolithic occupations at Sarup.

In the upper layers of some of the ditches in the southern part of the site were found rich occupation strata (fig. 9), deposited in what was either a recutting or a hollow resulting from consolidation of the fill. In these layers (which date from MN II to V) there were found 41,157 finds, and five times as many could be expected if all the ditches were excavated.

Labour requirements

It is difficult to judge the labour required to construct the defences of Sarup I. However some hypothetical norms can be set up, with whose help the labour requirements of the different tasks can be estimated. For Sarup I the calculation is as follows:

| | posts | wood in m ³ | earth in m ³ |
|--|-------|------------------------|-------------------------|
| <i>palisade</i> | | | |
| digging 572 m of trench: | | | 350 |
| posts: split oak trunks 3 m long and 42 cm in diam. | 1290 | 268 | |
| <i>enclosures</i> | | | |
| digging 455 m trench: | | | 85 |
| posts: 1.5 m long, 30–40 cm wide and 15 cm thick | 1200 | 75 | |
| <i>fences</i> | | | |
| digging 401 m ditch: | | | 35 |
| posts: 1.5 m long, 30–40 cm wide and 15 cm thick | 1200 | 75 | |
| <i>ditches</i> | | | |
| digging ca. 600 m of 2.5 m ³ per metre: | | | 1500 |
| total | 3690 | 470 | 1970 |

If a Neolithic inhabitant could dig out 2 m³ earth in a day, 985 workdays would have been needed. The posts involved the production of flint axes to fell them, felling, cutting off branches, splitting, and transport. We reckon with 3 work-days per trunk, which gives 11,070 work-days. Then altogether 12,055 work-days were used to construct Sarup I. This is equivalent to roughly 100,000 hours or 50 man-years. If Sarup was constructed in a single season it required the labour of 200 men for three months. On top of this comes refilling the ditches.

The interior

It has always been of great interest to know what went on in the area enclosed by the ditches of the Neolithic camps. One of the aims of the Sarup investigations was to see whether there were features that would support the discoveries and observations made in the ditch system. It was possible to investigate two thirds of the enclosed area of Sarup I, the remainder being under present occupation. The whole interior of Sarup II has been investigated.

In the interior were found 97 features of the Fuchsberg phase (fig. 3), which may be supposed to have been in use at the same time as the ditch system. Most of them were scattered postholes, but 19 were larger and had a special content of complete objects – therefore they are not rubbish pits. Nine of them held complete pots and one a complete axe. They are interpreted as ritual pits. Five of them lay less than 25 m from the palisade and the majority were situated at the southern end of the site.

In one of the ritual pits (Andersen 1976) there was a large funnel beaker (fig. 16) containing two other pots and a large quantity of carbonised grain, found to be 95.3% emmer wheat, 4% barley, and 0.7% other kinds of wheat (Jørgensen 1976). The crop was thus a monoculture, not even containing weeds. The pots bear characteristic Fuchsberg patterns (Andersen and Madsen 1977). Another ritual pit lay close by and also contained much grain (again a monoculture of emmer wheat), and the presence of sherds of the same pot in both pits show they were contemporary. Other pits contained a number of flint implements but scarcely any chipping waste, just like the basal layers in some of the ditches. For instance one group contained 7 pieces of flint waste and 10 implements. They were all scrapers that had had been used to scrape wood.

Thus the interior showed no traces of contemporary settlement with rubbish pits and house remains, but preserved instead in the ritual pits the remains of more exceptional activities. All in all it may be said that the main activity took place in the ditch system and not in the enclosed area. Also the difficult access to the interior shows that it was not much used.

SARUP II

The other enclosure at Sarup was only about one third as large as the first, and covered about 3.5 ha. on the flat southern part of the headland (fig. 17). It has been dated to about 3280 B.C. (carbon-14 dated by corn to 2530 ± 90 bc, K-2767). It was constructed in the Klin-tebakken phase, MN Ib (Berg 1951 and Ebbesen 1975, 53), and was about 120 calendar years younger than Sarup I.

The site is enclosed by palisades, enclosures, and ditches which together start on the SE side of the headland and cut across the older site, which must at that time have been greatly decayed.

The palisade

In contrast to the palisade of Sarup I with its substantial trench, the younger palisade was a lighter construction of parallel rows of small posts standing in a belt two meters wide (fig. 18A). The palisade can be followed for 159 meters, not along an even curve, but with two distinct bends. The postholes have an upper diameter of 20 cm and are 20 cm deep. The holes were made by posts that were hammered in, and were not dug. The poorly supported posts are unlikely to have been longer than a meter. There were about six posts to the meter, giving a total of about 900, and they were removed afterwards, with the result that the holes were often difficult to recognize. In some places it could be seen that posts had stood two, three, or four in line facing the ditches. The palisade, which was really not much more than a fence, was too weak to resist any force and no doubt served only as a boundary. Only a single small sherd was found in the postholes, and it gives no information about dating or function.

Enclosures

Connected with outer side of the palisade fence was a series of rhombic enclosures with sides measuring 6–10 m (fig. 18B). In contrast to those of the earlier monument, whose posts stood close together in a dug trench, the posts of the younger enclosures stood in postholes with diameters of about 30 cm and variable depths ave-

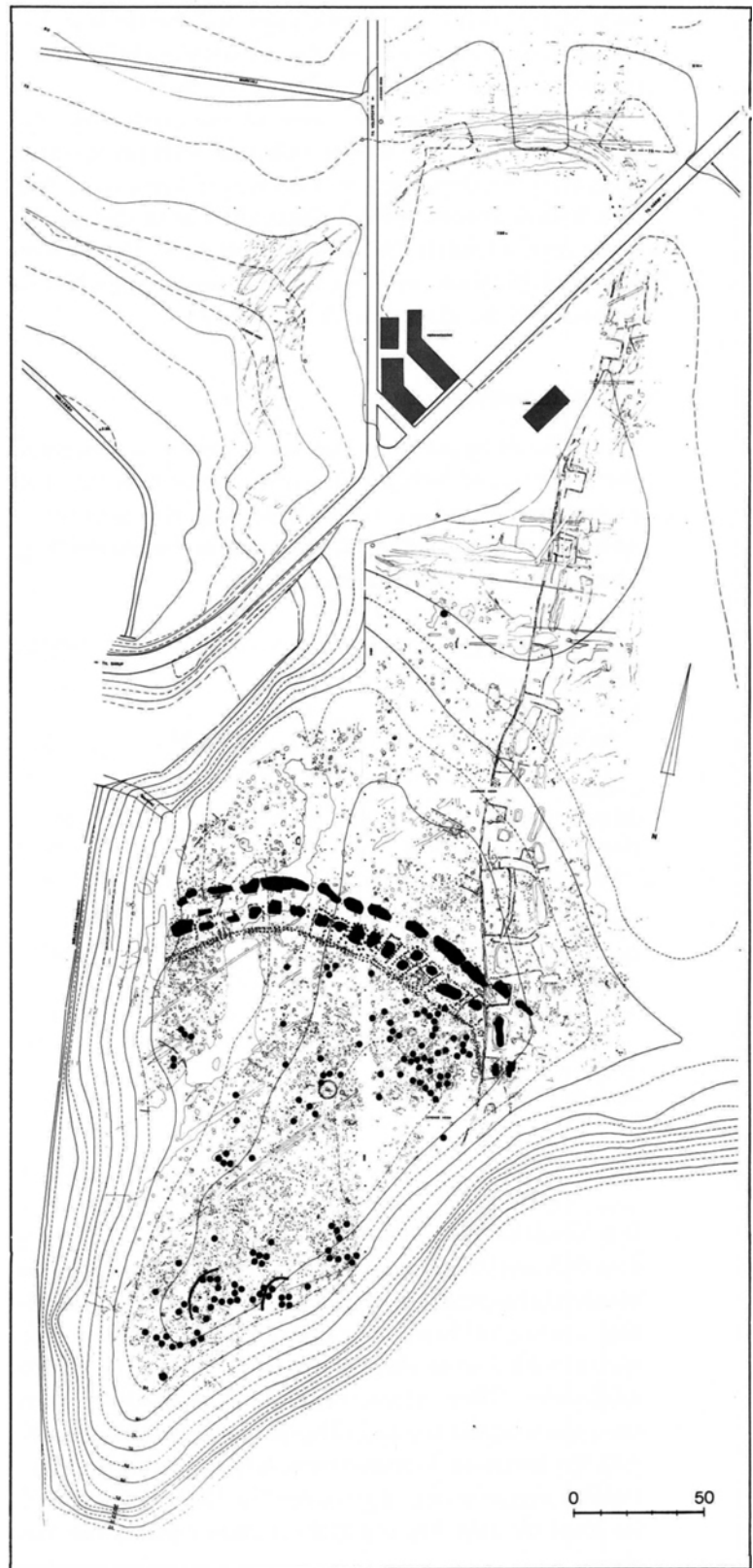


Fig. 17. Features of Sarup II shown in black; dots indicate ritual pits.

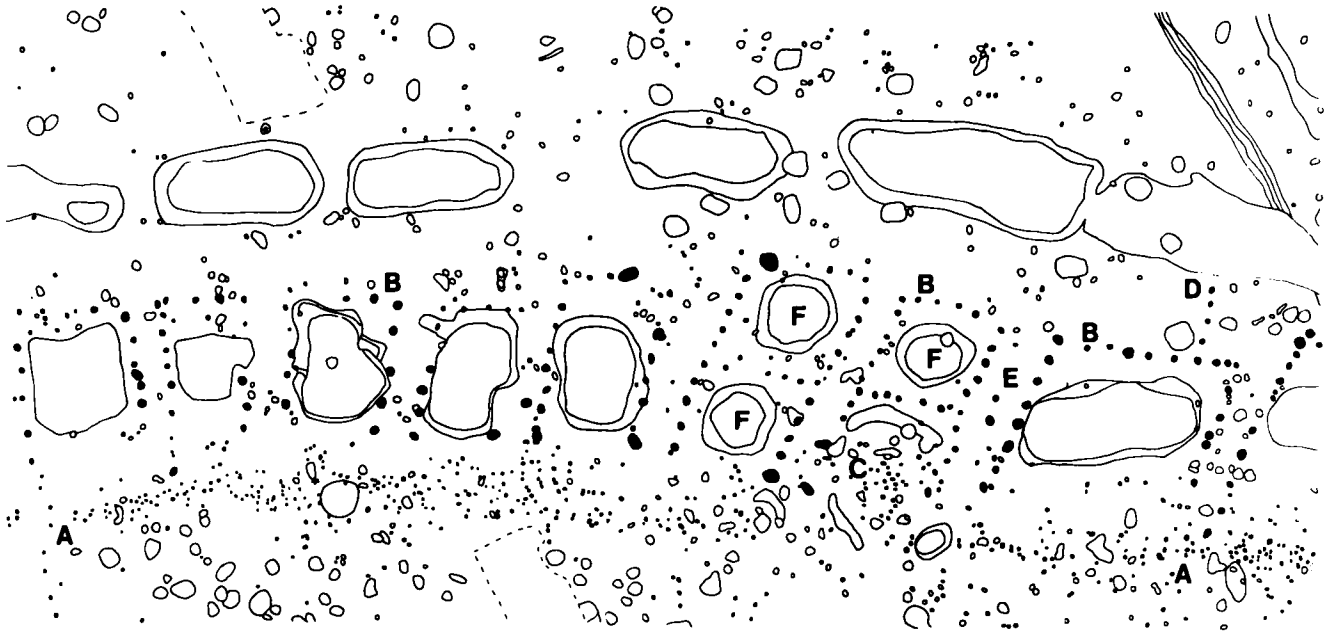


Fig. 18. Detailed plan from Sarup II's northern part. A, palisade postholes; B, enclosures; C, large tree-pit; D, other fences; E, fences in possible entrance way; F, undisturbed primary ditches.

raging of about 20 cm. The differences of depth may indicate that it was intended that the height to the top of the posts should be equal. It appears that the posts of the enclosures had the same height as those of the palisade – ca. 1 m. It can be estimated that 428 posts were used to build the enclosures.

Each enclosure surrounds a segment of the inner ditch, with a single exception (fig. 18C), which surrounded an undated tree pit (perhaps the enclosure surrounded a tree?). There were no enclosures around the segments of the outer ditch.

No ways of access into the enclosures could be seen, but the distance between posts may have permitted entry. Several re-diggings of the ditches in the enclosures shows that a lively activity took place (see below and fig. 22).

Altogether 23 sherds and flint flakes were found in the postholes, but tell nothing about their function.

Fences

At only a couple of places were any remains of fence structures observed. They joined the enclosures to the outer row of ditches (fig. 18D).

Entrances

No indications of entrances were recorded at Sarup II. However the side walls of one enclosure sometimes run parallel with those of the next, suggesting perhaps that they marked out ways of access. This was supported in some cases by the presence of cross posts, whose purpose was possibly to block further advance (fig. 18E).

Causeways

It is characteristic of this type of site that the ditches are interrupted by causeways. In the inner ditch of Sarup II there was a causeway about every 6.5 m, in the outer ditch one about every 9.5 m. The width of the causeways was up to 5.9 m. No connection can be seen between the positions of the causeways of the inner and the outer ditches.

Ditches

Also at Sarup II there were two parallel interrupted ditches, this time 4 m and 16 m in front of the palisade (fig. 17 and 18). The length of the segments varied from 3.9 to 18.8 m, average 7.9 m. In the inner row, where they tend to be more square, the average length is 6.49 m, in

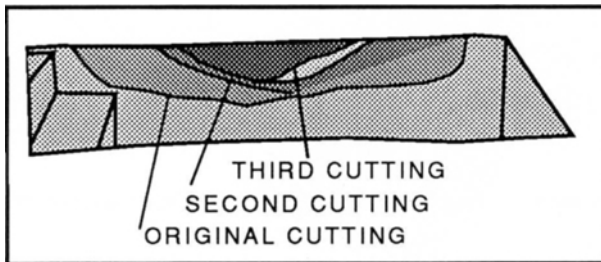


Fig. 19. Section across a ditch belonging to Sarup II.

the outer, where they tend to be more rectangular, the average length is 9.64 m. The width varied from 2.15 to 7.40 m. The largest widths are in the inner row, where in several cases the ditches have been widened by recutting.

Thirty ditch segments were recorded from Sarup II, with a combined length of 236 m, of which 57 m have been excavated. Only three segments were totally excavated, but trenches were cut across them all.

They showed up first as slightly darker soil changes, sometimes with black occupation earth from late deposits in the middle. Superimposed outlines of all the ditch sections (fig. 19) shows that they had flat to slightly concave bottoms at least 2 m wide, that the sides were originally nearly vertical, and that the depth ranged from 40 cm to 1.3 m, average 93 cm.

As at Sarup I there were no occupation or turf layers at the bottom of the ditches of Sarup II (fig. 19). At the edges of the bottom there were fine sand layers, probably blown in, and over this frequently collapse from the sides. This was all sealed by a fill of mixed sand and gravel derived from the material dug out of the ditch. An unstratified fill of this kind must be interpreted as a deliberate backfill. Backfilling took place from the sides of the ditches, where the earth no doubt lay as at Sarup I as low spoil heaps rather than as banks proper.

Only 72 finds were made at the bottoms of the ditches – less than one object per meter of ditch. In three ditches there were found large pieces of pot, which belonged to the same vessel in two ditches. Noteworthy was a nicely ornamented bowl, sherds of which lay on the bottoms of three ditches and in four pits about 15 m inside the palisade (fig. 21). This showed that the ditches and the pits had all been open at the same time. On the bottom of three ditch segments there were found poorly preserved animal bones, including the skull of a pig set around with hand-size stones.

Recutting of the ditches became visible as soon as the surface was cleaned. It was especially clear in the inner row (see fig. 18), which seems originally to have consisted of fairly small (probably ca. 4 × 4 m) pits (fig. 18F),

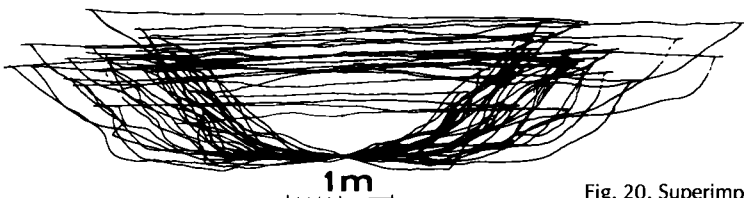


Fig. 20. Superimposed ditch profiles from Sarup II.

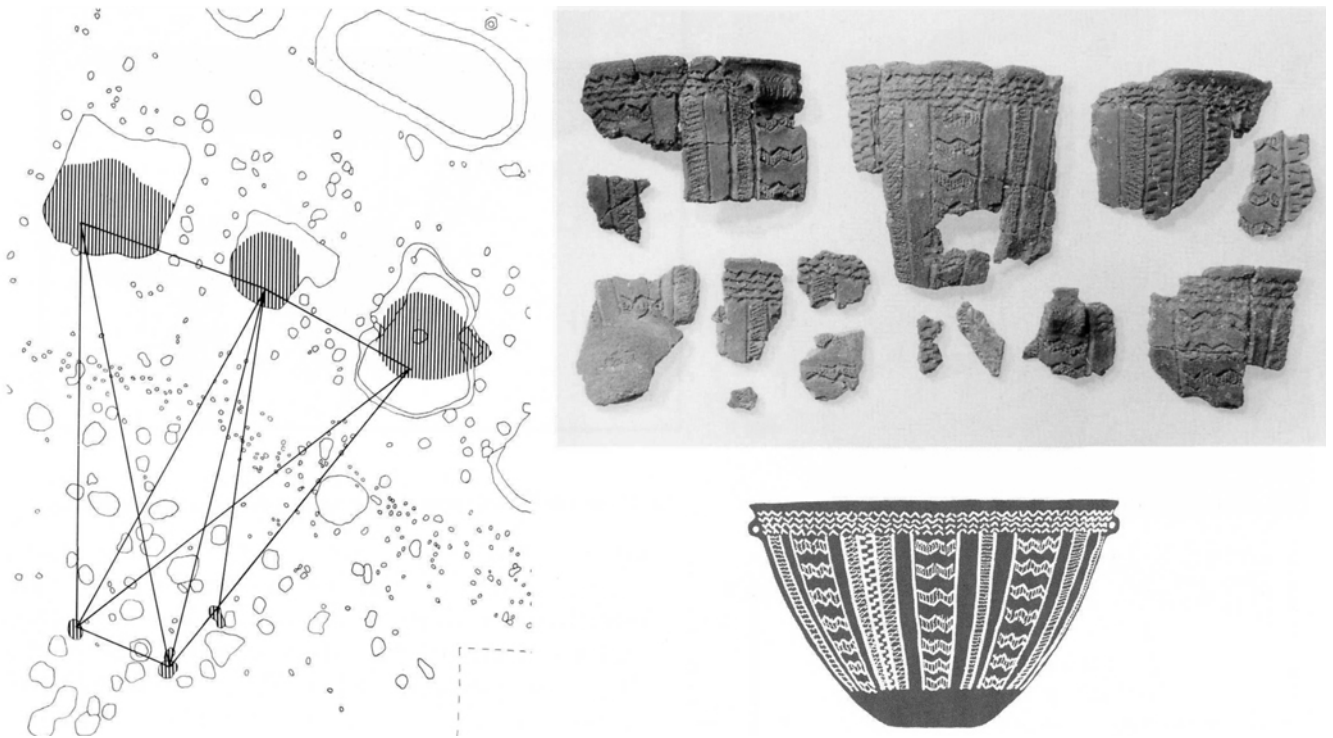


Fig. 21. Distribution of sherds of a decorated bowl from Sarup II, whose sherds were found in three ditch segments and four pits inside the palisade. The height of the reconstructed vessel is 18.4 cm.

which were enlarged and acquired their irregular form by recutting.

Two adjacent segments of the inner ditch showed particularly clear traces of recutting (fig. 23). In one case a recutting north of the original ditch could be seen at a high level. On that occasion some posts of the palisade were removed on the north and east. In the next ditch segment to the west (fig. 22) there were traces of three recuttings down to the original floor, but not touching any posts of the enclosure. It seems likely that the digging of that particular ditch segment, the building of a fence around it, the refilling of the ditch, and two further recuttings and refillings, all occurred during the lifetime of the enclosure fence, no doubt within a 20–30 year period. In both ditch segments there were later settlement layers from MN II and MN III/IV.

There were clear indications of recutting in only one of the segments of the outer ditch, where it was done parallel with the original ditch and had nearly the same depth.

The upper find-rich occupation layers were deposited 100–200 years after the ditches were dug. Some of

these occupation layers were found in the recuttings. In 29 ditch segments there were recorded 114 occupation layers with altogether 40,503 finds. One ditch had occupation layers from four phases of the Neolithic, another had no less than eight occupation layers.

Labour requirements

Estimate for Sarup II:

Labour requirements

Estimate for Sarup II:

| | <i>posts</i> | <i>wood in m³</i> | <i>earth in m³</i> |
|------------------------------|--------------|------------------------------|-------------------------------|
| <i>palisade</i> | | | |
| posts | 900 | | |
| 1.2 m long, 20 cm thick | | 34 | |
| <i>enclosures</i> | | | |
| posts | 428 | | |
| 1.2 m long, 30 cm thick | | 35 | |
| <i>ditches</i> | | | |
| digging of ca. 236 m of | | | |
| 2.9 m ³ per meter | | | 685 |
| total | 1328 | 69 | 685 |

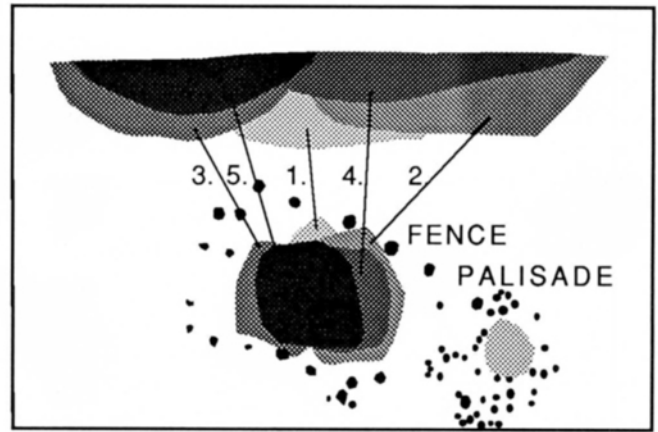
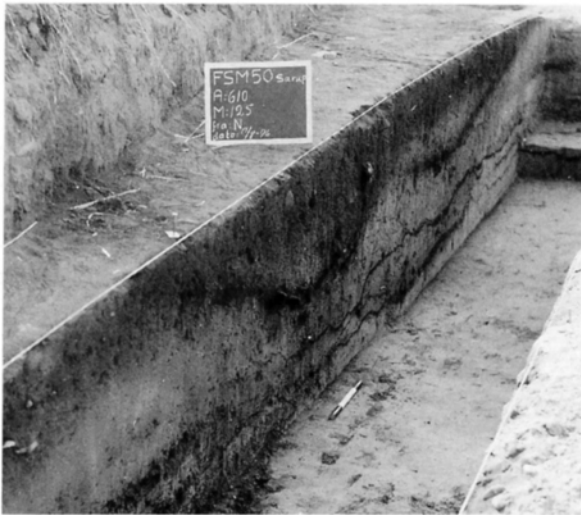


Fig. 22. Section through inner ditch of Sarup II showing recutting clearly.

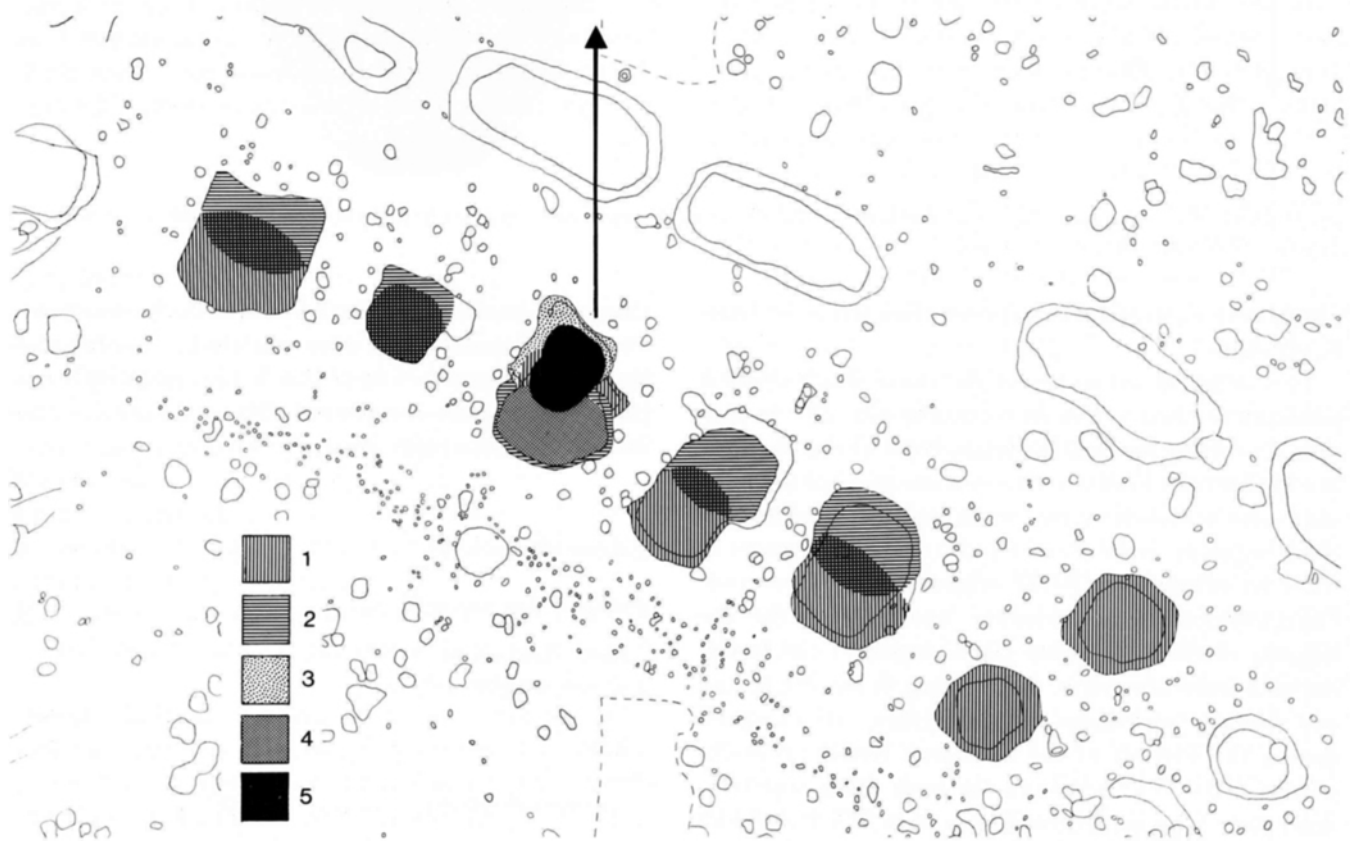


Fig. 23. Plan showing the sequence of recutting of two ditch segments.

Applying the same norms as at Sarup I (see p. 103), but allowing only 1.5 work-days for each of the smaller posts, the labour requirement for the entire work of construction would be 2300 work-days or 18,000 hours.

Thirty men could have built Sarup II in three months, while the estimate for Sarup I was 200 men for the same period. Thus at Sarup II a monument one third the size was constructed for one sixth the effort.

The interior

In distinction from Sarup I and most other similar sites it was here possible to investigate the entire area within the enclosure. In this 3 ha. area there were recorded 154 features that were contemporary with the younger ditch system. Most of the pits contained no objects (they were often small postholes) or only the kind of waste that would be expected at a settlement. Some other pits had vertical sides and flat base, and contained carbonised grain (emmer monoculture) at the bottom, possibly silos (fig. 24 and Jørgensen 1981), and 34 features had special contents. Some of these features lay in groups.

Some of the groups (fig. 17) lay close inside the palisade, especially in the north-eastern and northern parts of the site. It has already been observed that in the northern part of the site sherds of the same bowl were found in a group of four pits and at the bottoms of three ditches (fig. 21). There were also pit clusters in the southern part of the area, close to some curved trenches (fig. 25). These trenches were 18 and 26 m long respectively, with a width of 50–70 cm and a depth of about 10 cm. No signs of posts were found in them, and the finds were few and uninformative. Near them were many pits, and central to the arc of the eastern trench were found four large postholes (fig. 25A), placed about 2 meters apart in a square. They were about 1 m deep and had substantial stones at the sides (fig. 26). No other postholes on the site were so strongly lined with stones. The posts of a large structure must have stood here. In the fill of two of the holes were found burnt bones, including remains of a human being.

In a pit near the western of the curved trenches was found what is probably Sarup's best find, a battle axe of banded sandstone or quartzite (fig. 27), which lay in a shallow pit without much else. Some of the other pits contained complete pots or axes (fig. 28).

Compared with Sarup I it seems that a larger number of activities were transferred to the area surrounded by the defensive works, for one in five of the pits contained especially selected objects, while at Sarup I this kind of material was found mostly at the palisade and ditches, and in only a few of the features in the interior. This material must be interpreted as the remains of ritual depositions. It was also observed that relatively much grain was preserved in proportion to the limited amount of normal settlement activity indicated. It is not possible



Fig. 24. Section through supposed grain silo from Sarup II. The black layer near the bottom contained carbonised grain.

to say whether all the pits belonged to the time when the defences were constructed, or whether some were contemporary with the recuttings, but a happy discovery in the northern part of the site showed that certain ditch segments and pits stood open at the same time (fig. 21).

SETTLEMENT IN THE SARUP AREA

The two Sarup sites are very much alike, but their purpose is not immediately understandable. By examining the traces of contemporary settlement in the surrounding area it may be possible to gain an insight into the society in which the camps had some function. In an area of 204 m² surrounding Helnæs Bay it has been possible to record 216 megaliths and 15 settlements (Andersen 1980, fig. 12, 14, and 15 and Andersen 1988b, 52). In continuation of the excavations an attempt is being made to examine a representative sample of the other sites contemporary with Sarup I and II, with the aim of casting light on any connections between them and the camps.

Four of the settlements have been partially excavated. The best finds come from a site on Helnæs, situated near the bog Skaghorn and contemporary with Sarup I. Here 200 m² were dug in 1985 and more than 16,000 objects were recovered. What is of most interest are the differences between the material recovered from that site and from Sarup. Clearest is the difference in the proportion of flint waste to tools. At Skaghorn there were ca. 14 flakes per implement – against 3 per implement at Sarup. Obviously implements were not made to any great extent at Sarup, but were brought to the site

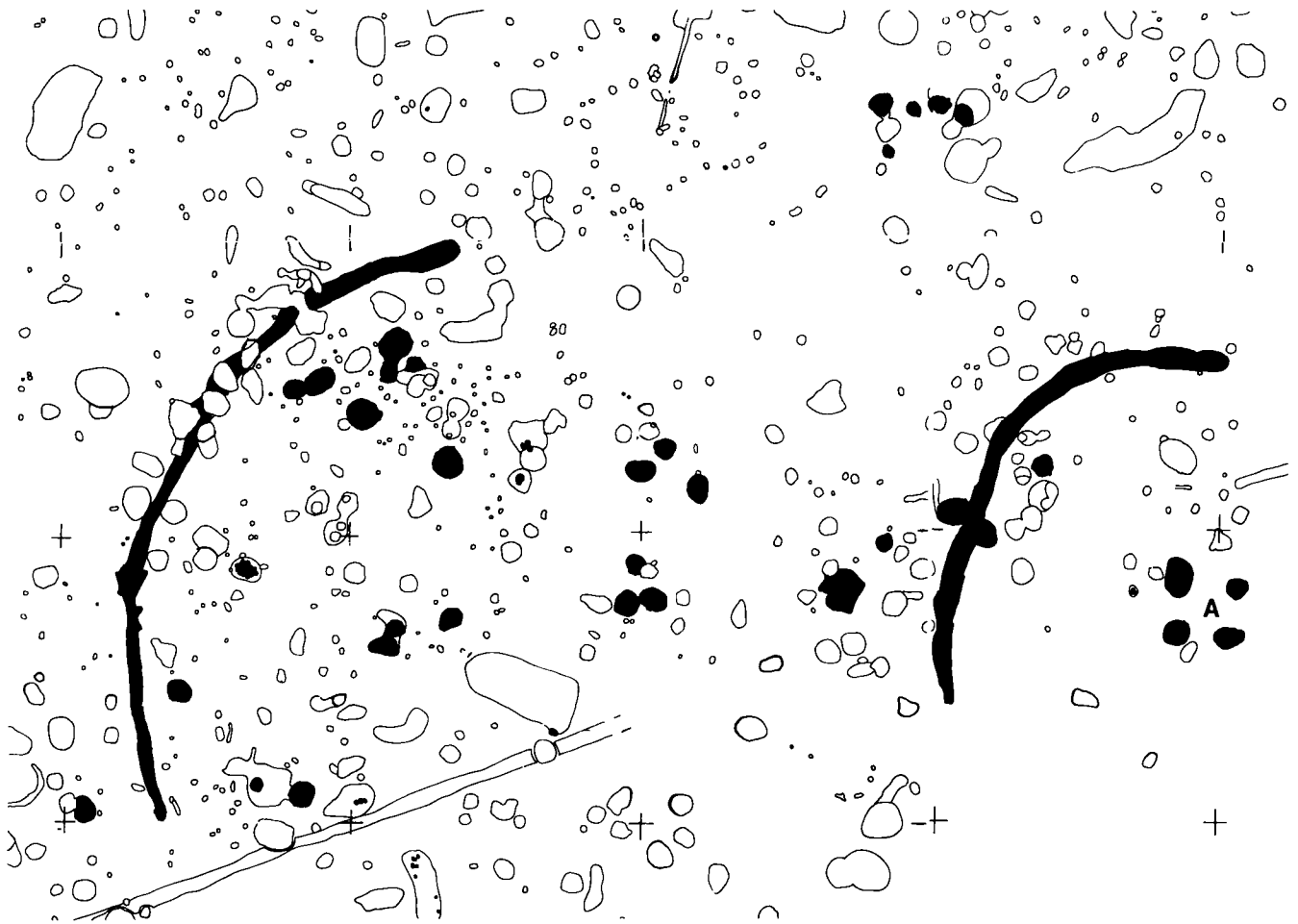


Fig. 25. Plan of area with arc-shaped trenches. Features belonging to Sarup II are shown black. A = square of large postholes.

from somewhere else. Knives were the commonest tools at Skaghorn, scrapers at Sarup (where they were used on wood). The pottery was of better quality at Sarup, although the same decorative patterns were used at both sites. Bones survived well at Skaghorn (not yet identified). The carbonised grain and seed at Sarup I indicated an almost pure monoculture of emmer (Jørgensen 1975), while the grain found at Skaghorn seems to have been half emmer and half barley. Was also selective grain placed in the pots at Sarup? Comparison of the two sites shows that their purpose must have been different. Skaghorn had the character of an ordinary settlement, while Sarup had more selected material.

Fifteen megaliths have been investigated, all of which were ploughed over and in process of being destroyed. In 9 of them there was found pottery contemporary with Sarup I, while in front of their facades

there was pottery from the same period as Sarup II. The dolmens of south-west Funen must therefore be built in the same period as Sarup I, but were still in use at the time of Sarup II. They exhibit considerable variety of plan, with both small and large chambers, chambers with and without entrance, and with both round and long peristaliths. No chronological development from simpler to more developed types can be seen in this material from southwest Funen.

Most of the dolmens lay fairly close to the sea and had a tendency to be gathered in groups in a way which could reflect territorial divisions (Andersen 1980, fig. 13). Closer study of the pottery from all the megaliths in a group may later show traits linking graves together or allowing comparison with Sarup.

Preliminary analysis of the finds shows that pottery was placed in front of the tombs whose decoration cor-

responded to that of Sarup II (showing that the ritual depositions took place a few generations after the graves were constructed), but the forms chosen were different. Commonest at the dolmens were pedestal bowls, pottery spoons, shouldered vessels, and small funnel beakers, while in the pits of Sarup II the commonest were large funnel beakers and decorated bowls. A funnel beaker like the ones from Sarup I and the Skaghorn settlement had been deposited on the northern side of one of the dolmens.

Compared with the material so far recovered from the Sarup area it seems that the activities that took place at Sarup were of an unusual and special character. The material was different enough from that of the settlements to show that there was no settled occupation. It seems rather to indicate jointly performed acts of a character we would look on as ritual, and the size of the camps does more than imply that they were constructed in collaboration by a very substantial number of people.

LATER AND EARLIER SETTLEMENT AT SARUP

In addition to the two causewayed camps there were three further phases of neolithic settlement, a burial structure from the Single Grave Culture (Andersen 1978, 7–16), a village with two houses from the end of the Bronze Age, settlement pits and wells from the beginning of the Iron Age, a village with seven houses from the middle of the Early Iron Age (Andersen 1984, 83–90), medieval field systems, and oldest of all, a pair of pits dated to the Maglemose Culture.

The three further neolithic phases are dated to the Middle Neolithic Funnel Beaker Culture, and are from periods II, III/IV, and V (Andersen 1980, 88–95). The remains of the settlements are found in the southern part of the headland and cover an area similar to that of Sarup II, i.e. between 3 and 4 ha.

The Neolithic settlements are indicated by occupation layers in the ditches and by many pits. It is interesting that up to 15% of the pits have selective contents suggesting that they were ritual pits. Others of the pits are large with kettle-shaped section (silos?), and others again are ordinary rubbish pits. The pits have yielded a rich material of more varied character than the finds from the two enclosure phases. Carbonized grain and seeds and animal bones have been recovered from the settlement phases.



Fig. 26. Section through one of the large postholes of A in fig. 25.



Fig. 27. Pit belonging to Sarup II with battle axe *in situ*.



Fig. 28. Pit belonging to Sarup II with three axes and a small potsherd *in situ*.

CAUSEWAYED CAMPS OF SARUP TYPE

Even the earliest Neolithic cultures were familiar with causewayed camps. However the ditches were not interrupted by causeways, but were continuous, often with V-section. These sites only enclose small areas in the order of 60×80 m.

The first sites of the same type as Sarup, with ditches divided up by causeways, were found about a century ago in Germany. Subsequently 3–400 similar sites have appeared in much of western and central Europe. All the sites were erected between 3800 and 3250 B.C. (Boelicke 1977). They vary considerably, ranging in size from $1/2$ to 107 ha and in shape from round to semi-circular or rectangular. Sometimes the sites are as close as less than a kilometre apart (Scarre 1982, 1983 and Marsac/Joussaume 1977) but it is not certain in these cases that they were fully contemporaneous.

Common to them all was that there were at least one and more often two to three parallel ditches interrupted by causeways. In the majority of the German and French sites there were also palisades on the inner side of the ditch (Boelicke 1977, Toupet 1984, Vermeersch 1978 and 1980). Most of the palisades were constructed in the manner of Sarup I, with closely spaced massive posts. Only at Sarup I were there observed heaps of sherds at the palisade.

Fenced enclosures, a characteristic feature of Sarup, were found in nearly the same form at Urmitz in Koblenz on the Rhine (Lehner 1910 and Boelicke 1977), where they were placed on the causeways of the inner row of ditches. Gaps in the palisade behind gave direct access to the enclosures. Parallels to the fences around ditch segments at Sarup II are known from Bùdelsdorf near Rendsburg (Hingst 1970, 1971, 1972), where three ditches close to the palisade were surrounded by powerful post-settings. Fences between the palisades and enclosures and the ditches have only been observed at Sarup. Entrances like that at Sarup I have been found at a few sites, including Bùdelsdorf (flanked by posts – see Hingst, above) and Noyen-sur-Seine (Mordant 1980a and b, 1981, Mordant/Mordant 1972 and 1977).

The ditches have been thoroughly investigated at many sites. The crab-claws shape as in the northern part of Sarup I (fig. 3 and 8) is found at several western French sites (Marsac/Joussaume 1977, Mohen 1984, Scarre 1982 and 1983). At the bottom of the ditches there is not found normal settlement debris, but selec-

tive material. Whole pots are sometimes found, singly or in concentrations, as well as unbroken implements, concentrations of animal bones, human skeletal material – most often only the head (Boujot 1985, Mazingue/Mordant 1980, Mercer 1980 and 1985), traces of fires (Biel 1987), and sealing layers of stones (Madsen 1977: 166). Some interesting observations were made at Etton in central England, where the material in the ditches of the western half of the site was sorted, so that some ditches held mainly pottery others flint flakes, and others again animal bones. In the ditches of the eastern half had been placed whole objects (Pryor 1985). The animal bones in causeway camp ditches seldom represent complete animals. At Boury-en-Vexin, northwest of Paris, a concentrated layer of beheaded sheep remains was found in a ditch (Lombardo/Martinez/Verret 1984). Human skeletal remains are a curious element at many sites. Complete skeletons may be found lying at the bottoms of the ditches, or there can be remains of heads, the cranium without mandible or the mandible alone, as found in a couple of fortunate instances at Sarup. At Hambleton Hill in southern England 70 skulls were found in the 20% of the ditches that were excavated, so that the whole site ought to contain about 350 skulls (Mercer 1980). The skulls must have been separated from the skeletons somewhere else, and were sometimes placed carefully in position, for instance on small stone cobbings.

Examination of the sections across the ditches showed in nearly all cases that they had quickly been refilled – sometimes in the same year as they were dug (Smith 1966 and 1971). In the western half of the Etton site however it could be seen that bushes and small trees had first managed to grow in the ditches (Pryor 1985). Re-cutting the ditches took place at many sites, but only at Hambleton Hill and Sarup was it possible to see that also the material placed on the bottoms of the recuttings was especially selected.

The interior was completely excavated in only a few cases, including Etton (Pryor 1985), Offham Hill (Drewett 1977), and Sarup II. Two of the sites had pits in the interior with a remarkable content of especially selected objects, while other pits contained normal settlement material. At Offham Hill there were no interior features.

In the area of the northern Funnel Beaker Culture a number of sites like Sarup have been discovered in recent years (Andersen 1982, 1986, 1987, 1988a and b,

Hingst 1970, 1971a and b, Jørgensen 1983a and b, Larsson 1982 and 1984, and Madsen 1977, 1978, and 1988). All the sites seem to be contemporary with Sarup and to have basically the same plan. The finds are generally of a deliberately selected character, indicating that the sites had a special purpose.

CONCLUSIONS

The many common traits of the two Sarups and similar sites show that they must have had similar or identical purposes in the various farming societies. Their use of topographical features might suggest that they were defensive structures, but the many causeways argue against this, as does the absence of a robust palisade at many sites (where pots were deposited at Sarup) and the small size and depth of the ditches, that at some sites were surrounded by low fenced enclosures (as Sarup II). Use as settlement is contradicted by the fact that some sites are situated on hills some kilometers from drinking water, while others are found in wet areas, that are flooded for half the year. The finds from the bottoms of the ditches and the interior areas shows only a limited amount of broken tools, flint chipping waste, and potsherds, whereas complete artifacts are overrepresented. Living structures of the same age as the camps have not been found at any of the sites. The specially selected finds, the large investment of labour in the construction of the camps, and the occurrence of human skulls and concentrations of animal remains suggest that the sites had a supra-regional significance for a population group of some size.

The Sarup sites were constructed and used at a time when big changes took place. The process of neolithisation was only completed when the sites were constructed, a process that brought about deep changes in the pattern of society, which also found expression in the construction of impressive megalithic tombs. The close contact in the Sarup area between megalithic tombs and causewayed camps should give rise to further studies of the relation between megaliths and causewayed camps in the whole west European area. The camps seem to have similar distribution to the megalithic complex, were approximately contemporary with the megalithic tombs, appeared at the same stage in the process of neolithisation, and had a ritual function in all the societies where they occur.

One can visualise an agricultural society living in small villages, whose families, or clans, buried chosen kinsmen in megaliths built near the centres of the area they inhabited. The megalithic tombs no doubt emphasised a hereditary right to the area cleared and made cultivable. Living in small territorial units gave a need for territorial markers at a superior hierarchical level where several clans together could cut a figure or show a profile in the face of the external pressures that may have been felt on the recently cleared and cultivated land. Perhaps Sarup was the place where the population of a more substantial area showed their common bonds by erecting a great structure and performing actions like sacrifices, burials, disposal of skulls. At intervals people met together to re-dig chosen ditch segments and perform such actions anew. Perhaps each clan had its own ditch segment. Where people met the occasion was also used to deal (in flint, amber, copper, livestock, grain, etc.), exchange information (perhaps patterns of pottery decoration which at that time spread rapidly across the country), settle disputes between groups, perhaps arrange marriages, etc.

Future studies of the finds from graves and settlements in a substantial area around Sarup will perhaps give an idea how large an area used a site, how often it was used, and what kind of activities were carried out.

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