MULTIDISCIPLINARY ANALYSES ON BRONZE AGE POTTERY FROM OTTERBÖTE, ÅLAND

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Abstract

The Otterböte dwelling site, in the outer archipelago of Åland, was excavated almost 50 years ago. Although the yielded finds were af great archaeological importance, they have all since been stored in the museum collections, without a comprehensive investigation. In a new project, the find material has therefore once again been subject to interest, especially concerning the ceramics. Based on multidisciplinary analyses, the intention has been to study the existing pottery from all different aspects, in order to achieve new knowledge about the history of the site and its hunters. So far the results are very promising.

Introduction

The Otterböte dwelling site is one of the most famous Late Bronze Age sites in Scandinavia. Situated in the outmost archipelago of the Åland Islands, SW Finland, it was partly excavated almost 50 years ago. Ever since it has been regarded as an extreme hunting station, seasonally occupied in connection with seal hunting on the ice.

Despite its fame, however, there has been no comprehensive investigation of the find material, and consequently there is a notable lack of detailed information about the settlement. In an attempt to achieve more knowledge, a small project was started in the 1980s, which by the means of multidisciplinary analyses was expected to shed some new light on Otterböte and its hunters. The work is now in its final stages, and some conclusions can be made. This paper gives a brief outline of the project and one of its central elements: the analyses of the pottery.

Research history

Otterböte is situated on Kökar, a small island at the edge between the outer archipelago and the open sea. The site was found around 1918, but it lasted until 1946 before a minor excavation took place. The results were published by M Dreijer in 1947. These first experiences led to the main excavation in 1950, which was led by C-F Meinander, B Schönbäck and M Dreijer. For that time, the results were more or less sensational, and they were published by Meinander in his dissertion from 1954, a publication that until now has been the basic Otterböte reference.

The site consisted of 9 round hut foundations, 5 refuse heaps, several open hearths and a water hole. The site area, measuring only 30 x 50 m, was on three sides surrounded and protected by naked rocks. The finds were rich in number, but have later been regarded as poor in quality and types. The pottery sherds totally dominate the material, followed by smaller collections of animal bones and stone artefacts. Although it was clearly a Bronze Age site, no bronze objects were found. Today most of the finds are stored in the Åland Museum (Mariehamn), smaller

Fig 1. The Otterböte site during excavation in 1950. One of the hut foundations, with post holes and a central hearth, is clearly visible in the foreground. Photo: Åland Museum.

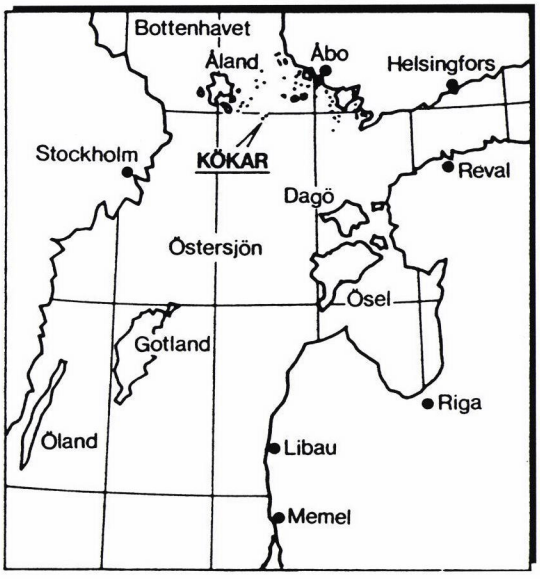

Fig 2. The site was found on the small Kökar island, in the northern Baltic.

parts also in the National Board of Antiquity (Helsinki) and in the Zoological Museum (Helsinki).

The modern Otterböte research started in 1974, when Ann Forstén published the animal bones. Not surprisingly she found that the grey seal (Halicoerus grypus) dominated the fauna material, followed by the ringed seal (Phoca hispida) and the eider (Somateria mollissima). More interesting, however, was the fact that she also found bones of domesticated animals; sheep/goat (Ovis/Capra), pig (Sus scropha) and possibly cow (Bos). Teeth and horn parts of sheep/goat, indicated that these animals were not only brought there as pieces of meat, but that they actually could have been kept on Kökar to graze during the summer (Forstén 1974). Accordingly,

the osteological experiences indicated a much more complex history than hitherto expected.

The present project has been focused on the ceramics. Although the pottery constituted 90% of the total find weight – and despite the fact that the term "Otterböte pottery" is well known in Scandinavian archaeology – there had until then only been cursory investigations of the sherds. Preliminary studies, however, indicated that there was much new information to yield. The new strategy has been to use scientific analyses in combination with traditional archaeological methods, in order to reveal as much of its secrets as possible.[1]

Dating

The dating of the occupation has earlier been based on typological aspects only, which naturally gave a rather uncertain time span; probably Period IV – V (1100–600 BC) of the Bronze Age. The material suitable for scientific datings was, however, not too promising. For ^{14}C there were a few pieces of resin and charcoal, and small amounts of charred organic residues sticked to some pottery sherds. The animal bones were considered too small and too valuable to be destroyed in a dating process, and at that time the project had no access to AMS-dating. For TL there were an abundance of seemingly uniform pottery sherds.

Six samples were chosen for conventional ^{14}C-dating. Three of them were charred organic residues, two were pieces of charcoal and one piece of resin. The analyses were carried out by three different laboratories; Helsinki/Su, Stockholm/St and Lund/Lu.

Four pottery sherds were chosen for TL-dating at the Dating Laboratory, University of Helsinki (Hel). A problem, however, was the fact that these sherds had been excavated almost 40 years earlier. Consequently, there was no data about the background radiation at the find spots. Later measurements at the site could only provide some general figures, which, of course, could distort the final results.

The ^{14}C values clearly signify that the site can be dated to the Bronze Age period, although the total time span is 555 ± 90 years. It is worth noting, however, that the three samples of residues from pottery sherds, are very close to each other, with a time span of only 60 + 80 years (table 1).

As could be expected, the four TL samples gave a rather wide result (table 2). One of them (K2) even falls within the Late Iron Age, and must therefore be excluded. The other three have a time span of 560 ± 250 years. Even at their lower level, the two oldest ones seem a little too old – at 3300 BP the site was probably still under water. The first sample, however, which gave 2900 ± 200 BP, goes well in line with the three mentioned ^{14}C samples. The evaluation of the calibrated and plotted values (fig. 3), indicate that the calendar age of the site – provided that there was only one, short occupation phase – falls within the time span 1100–900 BC, or Period IV of the Bronze Age.

These figures are further supported by a pollen analysis from a nearby bog, which also gave some information about the local degree of the land uplift. According to that, the site area started to rize from the sea between 1200–1000 BC.

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[1] The project will be published in autumn 1997, under the title; Otterböte – New Aspects on a Bronze Age Site in the Baltic.

no	lab	sample and type	C14-date
1	Su-972	ÅM 200:5 charcoal	3150 ± 90 BP
2	Su-973	ÅM 200:271 resin	3060 ± 110 BP
3	Lu-2159	ÅM 200:218 charred remn.	2790 ± 50 BP
4	Lu-2160	ÅM 200:153 charred remn.	2850 ± 50 BP
5	St-9519	ÅM 200:202 charred remn.	2805 ± 125 BP
6	St-9520	ÅM 200:485 charcoal	2595 ± 90 BP

Table 1. Samples and results of ^{14}C-datings from Otterböte. Samples 3–5 are charred residues – possibly remains of foodstuffs – on pottery sherds.

Typological analysis

The existing ceramic material consists of ca 23.000 sherds and fragments, with a total weight of ca 260 kg – and with a mean distribution of no less than 450 g per excavated square meter. In order to study its variables and types, the huge material has been subject to a detailed typological analysis. The system used is a modified version of methods worked out by B Hulthén at the Ceramic Research Laboratory, Lund University (Hulthén 1975; 1991). The rim sherds were given a further examination, and based on that the original material could be reconstructed.

Together, the Otterböte sherds seem to represent a total of ca 300 different vessels. The standard vessel was a simple jar, 4–6 litres in volume, with a coarse, rusticated layer on the outside surface. Furthermore, it was decorated in a distinct "Otterböte pattern"; 2–4 horizontal furrows at the rim, and vertical or inclined furrows at the body.

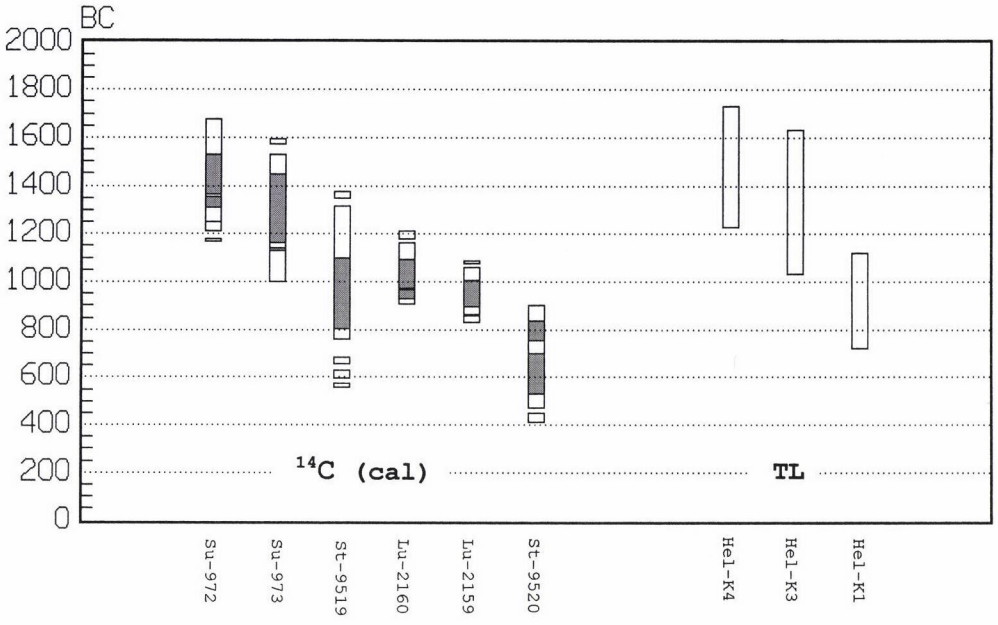

Fig 3. Calibrated results of the ^{14}C- and TL-datings from Otterböte. Dotted bars represent 1 sigma level, open bars 2 sigma.

no	lab	sample and type	TL-date
1	K 1	ÅM 200:215 pottery	2900 ± 200 BP
2	K 2	ÅM 200:153 pottery	1230 ± 150 BP
3	K 3	ÅM 200:230 pottery	3310 ± 300 BP
4	K 4	ÅM 200:202 pottery	3460 ± 250 BP

Table 2. Samples and results of TL-datings from Otterböte. Analyses carried out by the Dating Laboratory, University of Helsinki.

Admittedly, there are also a few other types, such as small profiled bowls, but percentually they are of less importance (fig. 4.).

This type of pottery is found in a narrow coast-bound zone, from Main Åland, along the Swedish east coast, down to Öland, Scania and the Danish islands, including Bornholm. A few sherds are also reported from SW Finland, but, as far as known, none from the Baltic countries. This south-western pattern has been known for long, but in all the mentioned areas – except for Main Åland – the local "Otterböte pottery" has played a very small role in the respective materials.

New, however, is the fact that corresponding vessels have had a huge impact in the Bronze Age Lusatian culture in present Poland and eastern Germany. Such pottery is found partly in the graves, but even more at the dwelling sites all over the Lusatian region. There are, of course, regional differences, but for instance, in the Archaeological Museum in Gdansk the author has examined sherds that are more or less identical to those found at Otterböte. When seen from a typological aspect only, it is no doubt that the Otterböte potters must have had their influences either from Main Åland or the Lusatian region.

Manufacture and provenience

In order to study the craft tradition, manufacturing technique, firing temperature etc, 100 representative sherds were selected for analyses at the Laboratory for Ceramic Research, Lund University. 23 of them were moreover subject to petrographic microscopy, to investigate the clay and temper in the ware. Corresponding analyses have earlier been carried out on several Swedish materials (Hulthén 1975; 1977; 1991). In the present case, reference samples of local raw clay from Kökar, and Late Bronze Age sherds from Åland, Bornholm and Poland, were also examined.

The analyses demonstrated that the majority of the Otterböte vessels are manufactured within the same craft tradition, and that the ware is based on a sorted, extremely fine clay, tempered with c. 15% of crushed granite. This clay, which occasionally also contains free crystals of olivine, differs remarkably from the Kökar raw clay, and it also differs from other Scandinavian materials. As far as known, such fine clays do not exist in Scandinavia, and olivine clays are only found in a few places in Central and Western Europe.

Nevertheless, among the reference samples from the Lusatian culture in Poland, there are several sherds that petrographically and typologically are very close to the Otterböte ones. Also when it comes to the temper material – crushed granite – there are features that point to the south; crystals of leucite and nocean, hitherto unknown in Scandinavian pottery.

IMPRESSIONS IN POTTERY FROM OTTERBÖTE		
CEREALS		
14	Hulled barley	Hordeum vulgare
5	Naked barley	Hordeum vulgare
2	Hulled or naked barley	
6	Emmer	Triticum dicoccum
2	Einkorn	Triticum monococcum
2	Spelt	Tritium spelta
1	Emmer or spelt	
3	Wheat	Triticum cf. aestivum
2	Oats	Avena sativa/fatua
1	Millet	Panicum miliaceum
PULSES		
1	Chick pea	Cicer arietinum
1	Grass pea	Lathyrus sativus
WILD PLANTS		
2	Crab apple	Malus silvestris
1	Sloe	Prunus spinosa
2	Sea rocket	Cakile maritima
1	Scurvy-grass	Cochlearia offic./dan.
2	Field cabbage	Brassica campestris
1	Black bindweed	Polygonum convolvulus
1	Lesser burdock	Arctium minus
1	Birch	Betula pubescens
1	Willow-hub type (?)	Epilobium mont./coll.
1	Sow-thistle type (?)	Sonchus sp
1	Orach type (?)	Atriplex sp

Table 3. Identified impressions in pottery sherds from Otterböte.

From a technological standpoint, one can state that the ware of the majority of the Otterböte vessels does not origin from Kökar or Main Åland – obviously it does not even come from Scandinavia. So far, corresponding wares are only found within the Lusatian culture in todays' Poland. It is only concerning a few untypical sherds, that one can expect a possible Åland provenience.

Vessel function

Ever since the first excavation, the large Otterböte vessels have been regarded as con-

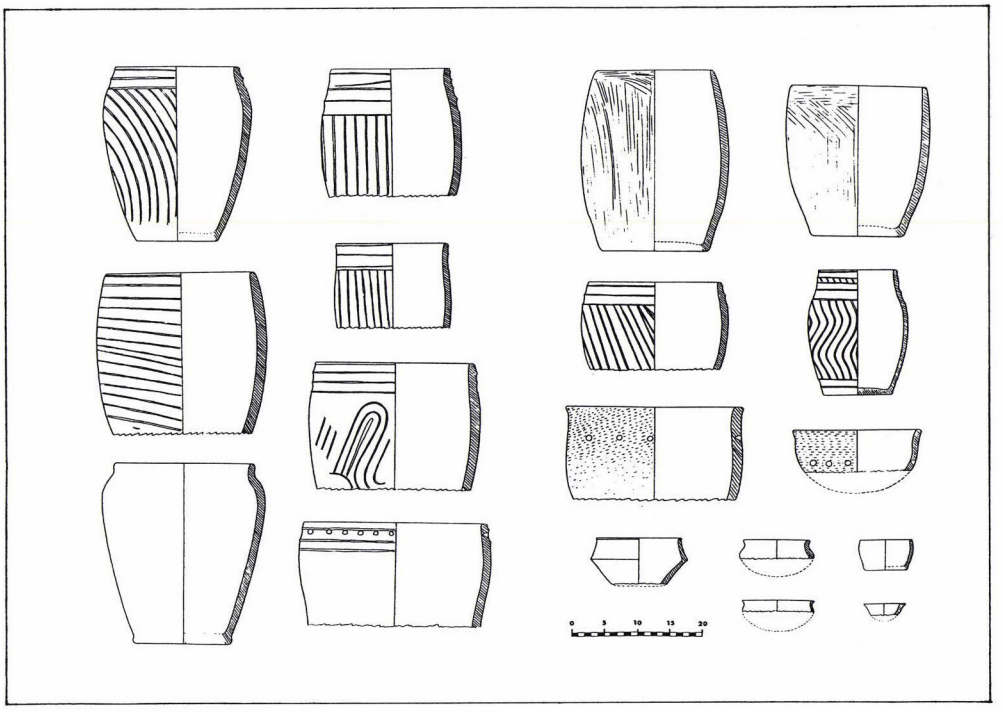

Fig 4. Different types of reconstructed Otterböte vessels. Most of them decorated with furrows in variating "Otterböte patterns".

tainers for storage and transport of train-oil. From an ethnohistorical point of wiew, however, such an assumption is more or less impossible. The great volumes of train-oil extracted in connection with large-scale seal hunting, must have required other types of vessels. On the contrary, it is more plausible to see these jars as normal house-hold vessels, used in the every-day life at the site.

Many of the Otterböte sherds have thin, charred organic residues at the rim, so-called "food crusts", which usually are regarded as remains of ancient foodstuff. In order to try to identify their origin, samples of four such crusts were subject to an analysis of the lipid content and fatty acid patterns. The analysis and the evaluation was made by the Archaeological Research Laboratory, Stockholm University, which for many years has been working on corresponding problems (Arrhenius, 1985; Arrhenius & Lidén 1988, Eriksson 1991; Isaksson 1996).

Unfortunately, two of the samples had a lipid content too low to give any exact answers. The two others were more promising. The fatty acid pattern of the first sample indicates a vegetable origin. The second one could actually derive from a marine-animal source, probably seal. Although the measurable samples were only two, they still indicate different sources, and obviously different types of foodstuff.

Cereal and plant impressions

When examining the pottery, it was noted that many of the sherds had strange surface impressions, reminding of grains and seeds (fig. 5.). 180 such sherds were presented to prof. Hakon Hjelqvist in Lund, for a palaeoethnobotanical analysis. The method is based on the fact that during the manufacturing phase, pieces of plants are often acci-

Fig 5. Typical impression of hulled barley, on the inner surface of a pottery sherd from Otterböte.

dentally mixed with the moist clay. When fired, the organic material is burned away, leaving a negative impression (see Hjelmqvist 1979).

Among the Otterböte sherds, Hjelmqvist could identify 54 impressions, originating both from cultivated and wild species (table 3, fig 6). 38 of them come from cereals; hulled barley, naked barley, emmer, spelt, wheat, oats and millet. Among the 11 wild species, there are, for instance, the fruits apple and sloe, the weeds field cabbage and black bindweed, and the beach plants/medical plants sea rocket and scurvy-grass.

Most sensational, however, are the single finds of chick pea and grass pea, two pulses that in a Bronze Age context never before have been found north of the Alps. If these impressions are identified correctly, they – together with the millet – clearly point to the south.

Conclusions

Although not all of the latest results are described here, all the analyses indicate one common answer; as well typologically, technologically as paleoethnobotanically, there are no indications that the Otterböte vessels are manufactured in a northern Baltic context. On the contrary, almost everything points to the southern Baltic, and the Lusatian culture in present Poland.

If this hypothesis is correct, it opens new perspectives on the life at Otterböte. Because it is not likely that possible Åland hunters, based at Otterböte, went down to the south to bring home ceramic house-hold vessels, it must mean that it actually was Lusatian hunters who came up to Otterböte and brought the vessels with them, to be used in the every-day life during their northern stay. Admittedly, these perspectives are not yet fully interpreted, but they surely give new fuel to the discussion on Bronze Age contacts over the Baltic.

The results can also lead us to another conclusion. Being an archaeologist, one does

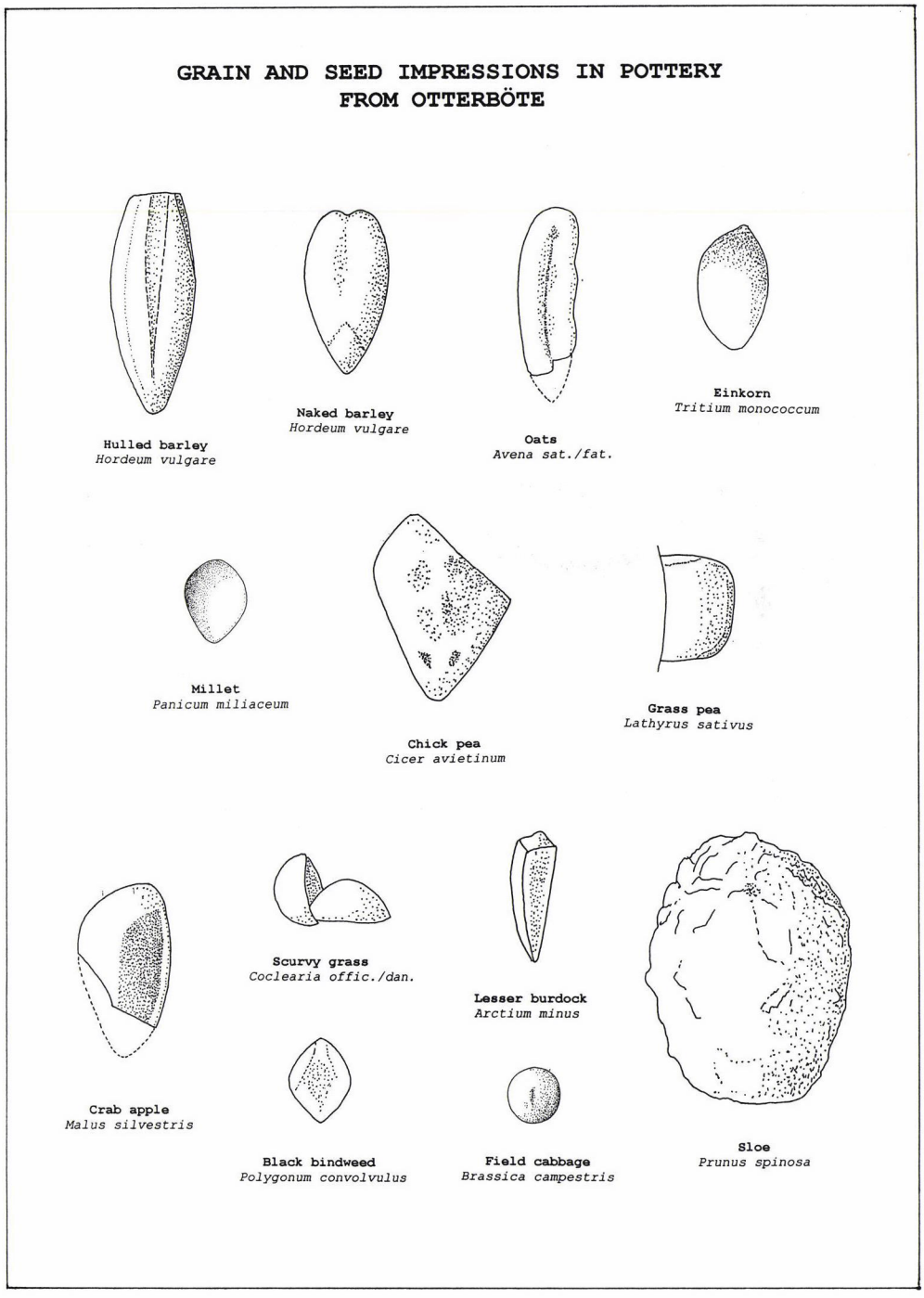

Fig 6. Drawings of silicone castings of some identified impressions in pottery sherds from Otterböte. Drawings: H. Hjelmqvist.

not always have to dig up new finds. Modern multidisciplinary methods – especially scientific ones – can definitely bring new information out of old materials, even if they for decades have been "forgotten" in the musem collections.

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