

REUSE OF AND NO USE OF LATE BRONZE AGE BRONZE SCRAP

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The work of Eva Weiler gives a point of departure for further studies in several fields to which I will refer during this presentation.

Introduction

Eva discusses the reason for the many and large hoards of bronze scrap found in Sweden. A changing social mechanism with disappearance of old mental barriers was replaced by new ideas. These were evidently brought about by people moving over larger areas perhaps missionairing or just travelling among people in the peripheries of Europe who were ready to adopt new symbolic artefacts in connection with new ideas and new technical skill.

In the second part of this paper I will present some of the soapstone moulds found in the West of Sweden. They have cavities for casting Late Bronze Age tools like sickles and tweezers. Eva discusses the origin of the moulds, their use and distribution range.

Scrap

As a background to these hoards the question of the origin of the copper has been raised. There are many minor copper mineralisations in Scandinavia and thus it can not be excluded that some of the copper for the Late Bronze Age bronze tools may have originated here. Still the overwhelming part of the ready made bronze tools or material for them came from the British Isles or Continental Europe.

In the Late Bronze Age the growing interest in Northern Europe for bronze scrap, which is found in many and large hoards, thus not consumed, indicates a new way of its use. The scrap was probably brought by itinerant smiths who looked for new markets, where the inhabitants interest in getting better tools and more beautiful adornments could be aroused. Or was this change in forms, a sign of change of intrinsic values, hand in hand with a missionary undertaking? It was evidently important to have the right set of miniature toilet equipment or small razors bunted with the dead. Such objects are found in the now common cremation burials, where the ash is put in an urn and the urn in a pit. Was there a common demand for these items or was the motivation of the inhabitants subjected to pressure?

Eva discusses also the possibility of a control system for the distribution of metal. Could the weight of the standardised items constitute a numerical value? To check her ideas she examines the larger scrap hoards in the southern part of today's Sweden, especially in the Falbygden area in Västergötland. The hoards she has chosen to focus on can be seen on this map. No 1 comes from Ystad, Scania. But, as we can see, most of the hoards are found around Lake Vänern. No 2 is from Järn in Dalsland. No 3 from Kareby in Bohuslän, No 4 is from Grava in Värmland, No 5 from Håle-Täng in Västergötland. And there is only one hoard as far north as close to the lake Mälaren, No 6, Härnevi in Uppland.

The hoards mainly contain bronze waste from casting, ingots, broken sickles and broken sword blades, socketed axes badly cast or broken, a few neck or arm rings, fibulae, bundles of double bronze wire and rods. The Grava hoard also contains seven bronze lure fragments. Some of the swords were bent which may indicate that they first had been ritually buried. Later they were recovered and then incorporated in the hoard. The Ystad and Jam hoards also contain masses of almost pure copper. Alloy compositions in different kinds of scrap items possessed by the smith, guaranteed the correct alloy for making either new tools or fibulae.

Two categories of artefacts common to all of the mixed hoards are the broken or badly cast socketed axes and sickles. The later are curved and narrow-leafed with hatting notches on the back and often with saw-toothed edges used for harvesting crop or leaf-fodder. None of them is complete. They have been systematically broken into smaller pieces, similar to broken harvest implements found in hoards in Central Europe (Miiller-Karpe), In Romania (Petrescu), the Alps (Primas) and Italy (Tovoli). The scrap hoards seem to have been accumulated during the Late Bronze Age and the scrap is never mixed with bronze from the Iron Age. However the unbroken sickles, razors, tweezers, studs etc. have almost all been found in late Bronze Age cremation burials and seldom in scrap hoards. Those few unbroken sickles found in hoards have never been used as tools, testified by the superfluous metal not removed and that the edges are seldom hammered. Broken sickles are never found in axe-hoards.

The pieces of broken axes and sickles mostly produced in Central and Southern Europe seem not to have standard weights. There is no conformity between the weights of the broken pieces. However, there seems to be some general principles for how and where to break the objects. And pieces of broken sickles do not conform from one hoard to the next. Thus the fragments from the Kareby hoard come from very heavy items compared to those from Nya Åsle.

Why were the tools broken and how were they going to be used? Was the metal supply diminishing? On the other hand there are broken metal objects found in parts of Europe, where the metal was native to the place. Did the owners in Central Europe have no use of bronze axes and sickles when the iron had made its successful entry? Is that the reason why the scrap was carried all the way to areas with still none or little knowledge of the manufacturing of iron?

There may be several by se independent applications of the broken tools. As said before, they could have been melted down and used for the casting of new items like adornments or toilet equipments. The small pieces of broken bronze items could also have been used by people, perhaps living in peripheral areas, as a substitute for the probably religiously more correct but more expensive toilet sets and razors, common in richer burials at that time? In one ship formed stone setting in the eastern archipelago, were on top of some urns, containing the burned remains of the deceased, broken pieces of bronze artefacts. Today it is difficult to recognise their original way of use. One bronze piece was a broken piece of a razor or a sickle. Another was a piece of thread etc. The bronze pieces had been broken before the burial and had not been in the pyre. This use of the broken implements must also be taken into consideration. How common are such pieces in cremation urn burials in Scandinavia from the Late Bronze Age?

Moulds

Several scrap hoards also contain moulds for casting implements, mostly objects which were intended for burials. Many of these Late Bronze Age moulds are found in the South Western part of Sweden. Did this had to do with the rather abundant depositions of soapstone in the area? Soapstone is easy to carve and extremely resistant to high temperatures and as such the most common raw material for Scandinavian Late Bronze Age moulds. One of Eva's undertakings was to register soapstone occurrences close to Lake Vänern and also if possible, trace old mining. She intended also to have chemical and isotope analyses made on a few soapstone layers and compare them with Bronze Age

soapstone moulds found in the area. She hypothesised that the craftsmen perhaps tried to find new markets in remote Värmland, when the interest for their products by people in the more populated areas in Southern Sweden, failed.

But there may also have been other reasons for the casting of new objects. Were they produced to be broken in precise measured pieces with fixed weight to serve as a standard for payment? Or were they even cast in pieces in a mould for sickles, which an example with elevated edges around every piece may be proof of?

There are 85 registered moulds for bronze tool production found in the south of Sweden, only one is made of bronze, the other of clay or stone, mostly soapstone. 60% of the moulds were made for socketed axes and 12% for sickles. Eva considers the production capacity for one mould to be about 50 castings according to Rowland 1976. The moulds were in many cases made with several casting cavities for more than one tool. One of these moulds differs from the other, the mould from Torbjörntorp in Central Västergötland. It has one cavity for a knife, one for a socketed chisel and two for rods. The knife and the chisel were evidently tools ready to use, but the rods? Were they intended to be used as some sort of standard? In another hoard from Jam, close to Lake Vänern, there was another rod fitting exactly into the Torbjörntorp mould. The weight of the rod from Jam corresponds with the weight of a pair of tweezers and two rods from Jam to the weight of a razor. So each rod made in the Torbjörntorp mould could correspond to a set of ordinary toilette equipments for a Late Bronze Age burial.

Conclusion

In this conclusion, minor parts may be shadowed by my own reflections. The changing way of the external form and size of the bronze artefacts used in Late Bronze Age Scandinavia points to a changing culture especially visible in the changing burial practices. However it remains to understand if there were other applications of the broken axes and sickles than just making new razors and tweezers. Could these pieces have been thesaurized in some way? This idea is also brought forward by Silvana Tovoli about the huge scrap hoards found in Italy, especially the one in Bologna? The hoards in the Alps, Bulgaria and still more in Romania are many and substantial. The hoard in Bologna contains almost 15.000 pieces of bronze and weighs almost 1500 kg. The objects most represented are the axes weighing about 500 kg. The items in this hoard were assembled during perhaps 700 years and buried around 700 BC. They were evidently part of a storage for a foundry.

For some reason the axes and sickles were not a success in their original function. Once designed for practical purposes, they underwent a change to non-utilitarian functions as burial symbols, currency or fractional metal values in Late Bronze Age society.

Most often hoards were hidden and the owner never came back to use it. Accidents, pestilence and wars may often have hindered access to them. There is also evidence for a climatic deterioration during this time which would have had profound effects with increased climatic moisture causing diminishing harvests and so populations. In addition, we also have to take into consideration that the slow transportation over wide areas also were hindered by rain, cold weather and growing marshlands that may have delayed the arrival of the smith and affected the delivery of his stock. Thus he may have arrived late and found that his material and talent was outmoded and not requested anymore. This had a retroactive effect on the whole line of metal supply all the way down to Romania and Bologna. Can that have been the terminal reason for the abandoning of the remaining bronze hoards in combination with the use of the new magic material, the iron?