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LABORATORY ANALYSIS OF A BISHOP'S GRAVE AT SIGTUNA, SWEDEN AND ITS SILVER THREAD APPLIQUÉ

In the summer of 1993, a bishop's grave dating to c. AD 1100 was discovered in the central area of Sigtuna's early medieval town. The burial was frozen *in situ* and transported to the Archaeological Research Laboratory at Stockholm University. Investigations there uncovered a fragment of a pewter ampulla and an appliqué cross of silver thread (Sw. *posamentarbete*) belonging to an item of dress. Examination by scanning electron microscope (SEM) showed this thread to be formed of flat silver lamellae spun around a silk core.

Introduction

During the summer of 1993, a research excavation was carried out by Sigtuna Museums in the central area of Sigtuna's early medieval town (fig. 1). A royal manor was most likely erected in this area in connection with the founding of Sigtuna around the year AD 980. In 1992, evidence of a minting house close by had produced finds from the earliest coin stamping in Sweden. In the middle of the 11th century, the profane settlement on this site was terminated by the erection of one of the town's first Romanesque churches (Tesch 1992). This church is not known from written sources and the aim of the excavation was to establish what status it held. In the course of excavation a grave was found which attracted special attention. The grave was located up against the outer nave wall and had been exposed to the church's eaves-drop, a location which was considered especially distinguished. One of the few objects to be found in the grave was a walrus ivory crozier, and it thus seemed apparent that the skeleton was the remains of a bishop. The grave is dated stratigraphically to sometime

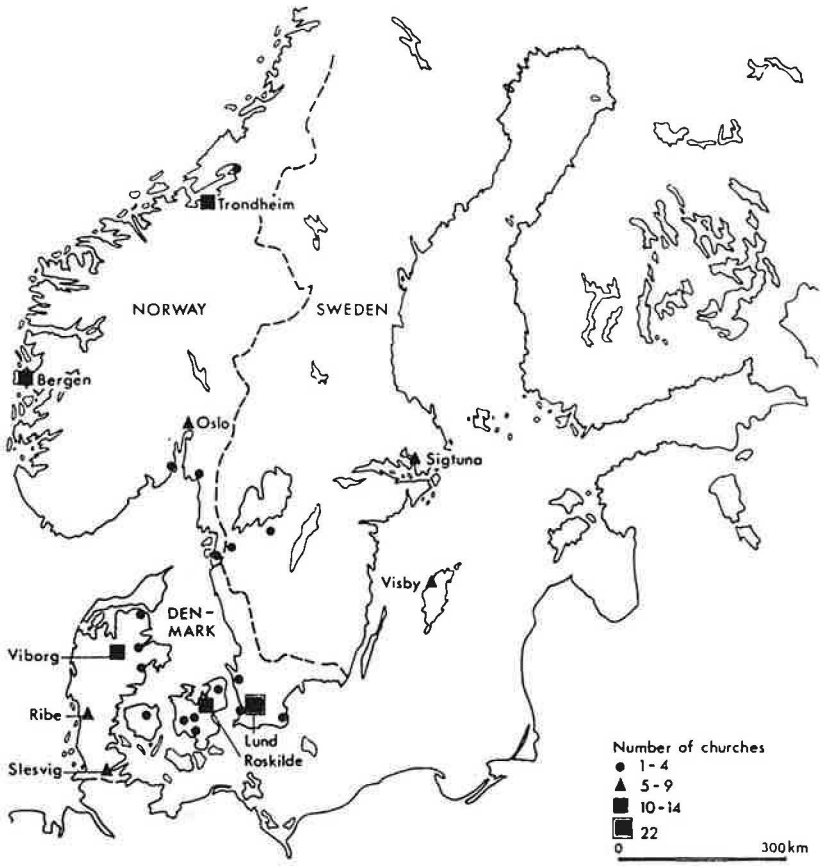

Fig. 1. Towns in Scandinavia AD 1000–1150. Size of towns in accordance with the number of churches they contain. After Tesch 1992.

Fig. 2. The bishop's grave from Sigtuna with walrus ivory crozier, silver cross, fragments of pewter-ampulla and iron-rivets. Drawing Bo A. Zachrisson

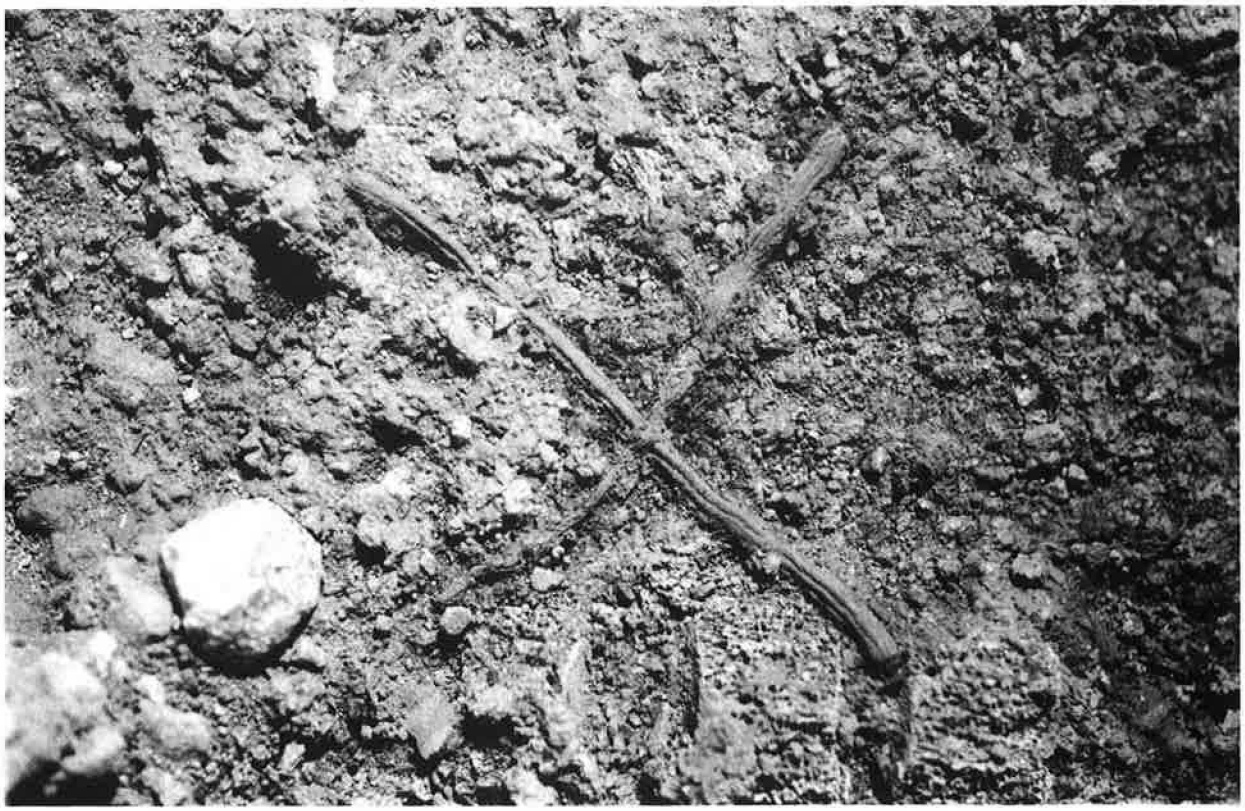

Fig. 3. The silver cross in situ, *situated high up on the ribcage on the skeleton's left side below the chin. Photo Björn Petterson.*

between the end of the 11th century and beginning of the 12th, which makes it the oldest bishop's grave excavated in Sweden. The burial had been damaged by previous investigations from the early 20th century, and only the upper half of the torso survived. Those parts of the lower arms which remained, indicated however that the bishop had been laid out with hands placed on the lower abdomen (fig. 2). Such an arm position is further support of an early dating.

Excavation in the laboratory

On account of the unique character of the burial and the poor condition of the skeleton, it was decided that the grave should be frozen *in situ* using carbon-dioxide ice (H_2CO_3). The frozen package was then kept in the freezer at the Archaeological Research Laboratory (AFL) at Stockholm University, awaiting excavation.

During the early spring of 1994, excavation was carried out in the form of an inter-disciplinary project, involving archaeologists from Sigtuna Museums, the present author as co-ordinator from AFL, and an osteologist from the Museum of National Antiquities, Stockholm. The intention was to preserve the grave as intact as possible for subsequent exhibition purposes.

First of all, the grave was X-rayed as soon as it thawed. During the ensuing examination, it became clear that the bishop had lain in a narrow wooden coffin of which only four iron nails with adhering remnants of wood (pine) remained. Over the abdomen lay a strongly oxidized and fragmentary metal object which X-ray diffraction analysis showed to be pewter, with an X-ray image in the shape of a small bottle. Probably this should be interpreted as a liturgical/pilgrim's ampulla. The skeleton was embedded in soil rich in cultural deposits, and chemical analyses of this soil showed that fermentation had probably taken place. As a result, the chances of discovering any textiles were considered minimal. It was therefore especially exciting to find a thin silver cross situated high up on the ribcage on the skeleton's left side below the chin (fig. 2).

The cross

The silver cross was executed in the metal thread appliqué technique (Sw. *posamentarbete*), whereby applied dress ornament is constructed from metal thread formed of silver (or gold) lamellae entwined around a (usually silk) core. The cross shape is made up of two 8.5 cm long bands, each c. 0.3 cm wide (fig. 3). As was the case with the pewter object, the silver bands were highly oxidized and the silver metal almost pulverized. Examination by light microscope (fig. 4) and scanning electron microscope (SEM) showed that each band consisted of three fishbone-patterned plaits. The bands were arched from the slight overlapping of the plaits. Each plait was made from three Z-turned strands. These strands each consisted of flat hammered silver lamellae spun around a textile core. SEM-micrographs showed the core to be a length of silk (fig. 5). The width of each

silver lamella is c. 0.2 mm. Most usually in metal thread appliqué work, the textile core is linen or silk, though wool has been recorded from one Polish grave-find (Moszcynski 1990).

Discussion

In Sweden, metal thread appliqué work is best known from the graves of the Viking Age proto-town Birka, where over 40 of the 1100 graves produced examples (Geijer 1938). These have been interpreted as indicative of garments of oriental character (Hägg 1983; Jansson 1988). Some of the more recently excavated graves at Birka have also produced similar work, one incidently in the shape of a cross-arm! In these however, it has been shown that the metal consists of fine *drawn wire* (Arrhenius 1978; also Holmquist Olausson 1993:43–49). Finds of wire-drawing instruments show that the technique was employed at Birka. Inga Hägg has linked wire-drawing to Russia, especially the district of the ancient Kiev-empire (Hägg 1983:208). Ingmar Jansson cites examples which include Gnezdovo near Smolensk and Šestovicja near Cernigov in the Dnepr area (Jansson 1988:601; cf. also Spicyn 1905). The technique using drawn wire is generally considered by textile experts as the more primitive: spun lamellae being more difficult to produce. In this respect, it has hitherto been claimed that Birka differs from other Scandinavian Viking Age cemeteries producing finds of metal thread, such as Mammen in Denmark and Valsgärde in Sweden (cf. Jansson 1988:597), where threads spun from flattened lamellae were used. This latter was the technique most widespread in western Europe during the Merovingian period and later, coming originally from Byzantium. The only known exception, as pointed out by Crowfoot and Hawkes (1967:56), is the frontlet of drawn gold wire found in the famous female royal grave at Cologne Cathedral, from the first half of the 6th century AD (Doppelfeld & Pirling 1966:11). The drawn-wire technique is still used by the Saami in northern Scandinavia in their work with drawn wire of tin, which they apply especially to leather. In archaelogical contexts it has been considered that the Saami learnt the technique from the Vikings (Geijer 1938:72f; cf. also Serning 1956:42–42; Zachrisson 1984:80). Saami sacrificial deposits, whether contemporary with or later than the Viking Age, include work using drawn silver wire (Serning 1956:Pl. 7, 4–7). Perhaps one should enquire whether the situation might not be the reverse? i.e. that the Saami taught the technique to the Vikings. The textiles considered to be executed with thread of (spun) lamellae in the Valsgärde finds referred to above, in fact proved however on examination of museum finds, to include drawn wire. From among recent unpublished finds, mention should also be made of a grave find uncovered in 1993 at site Raä 59, Valsta parish, Uppland, which included a bead (button) executed in drawn silver wire (pers. comm. Gunnar Andersson, Raä-UV). The same type of button occurs also in an older find from one of the graves in the Hovgård cemetery on Adelsö (Rydh 1936:79), to mention one other example. It would thus seem that Uppland at this time was an area where these two different techniques met.

Fig. 4. Detail of the silver cross (c. 20×). Each band consisted of three plaits made from three Z-turned strands. At the end of the band a strand can be seen with the silk core exposed. Light microscope. Photo L. Holmquist Olausson.

To the best of my knowledge, no other cross executed in metal thread appliqué technique has been found in any archaeological context, though sewn-on silk textile crosses occurred at e.g. the Alamannian cemetery at Giengen an der Brenz (Hundt 1978). Similar crosses from the 10th–11th centuries were found in the archbishop burials from Bremen, mentioned below. In several illustrations from the 9th century and until the end of the 11th century, from both East and West, the stole is shown bearing crosses which strongly recall the silver cross from Sigtuna. Such, for example, can be seen in the 9th century *Chludov Psalter* (State Historical Museum, Moscow) (Cormack 1977:149–150) (fig. 6). The technique in which these stole-crosses are made, cannot be ascertained from illustration alone, though to judge by the width of the cross arms, most likely these are metal-thread appliqué.

Conclusion

In conclusion, it can be said that the bishop from Sigtuna had been buried with rather simple equipment, though it must be remembered that we are dealing with a missionary period in Sweden. Apparently it was only later or in

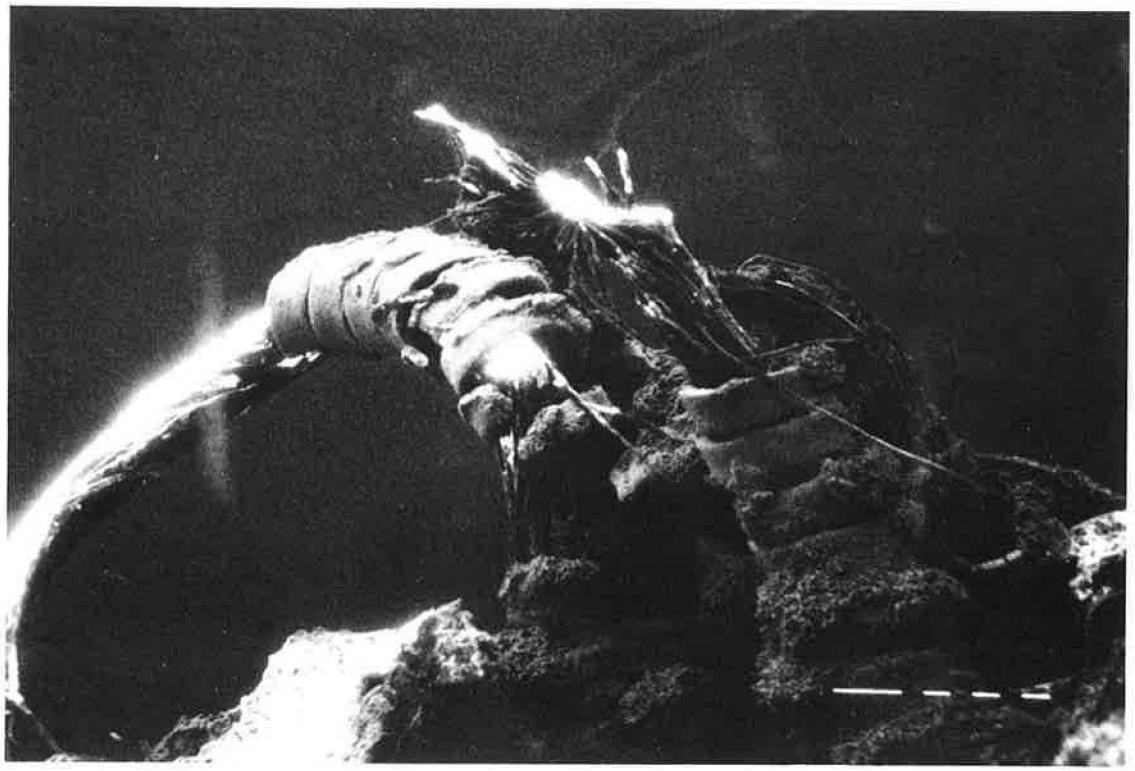

Fig. 5. The flat silver lamellae (width 0.2 mm) spun around a silk core. SEM micrograph L. Holmquist Olausson.

the case of archbishops in their homeland that such burials took on the lavish form of the e.g. archbishop graves from Bremen, excavated by textile experts and conservators in Stockholm (Nockert 1986).

The spun silver cross from Sigtuna is now cleaned and stabilized, and has returned to Sigtuna together with its bishop, to once more be placed below ground, though however this time in Sigtuna's newly opened museum.

Fig. 6. Detail of Fol. 51v Chludov Psalter, State Historical Museum, Moscow. Note the crosses on the stole. After Cormack 1977, p. 150.

A collection of articles concerning this bishop and east central Sweden's earliest Christianization, is due for publication later this year.

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