

# English Summaries

## Borrebjerg – a 12th Century Fortification on Langeland

*By Jørgen Skaarup*

In 1946-47 the Langeland Museum excavated the fortification Borrebjerg, situated on a small island in the now dry Magleby cove on South Langeland. By means of a 120 m long, peat composite, semicircular mound along the eastern slope, the 10 m high, undulating island was transformed into a defensible area, which in times of contention would increase the security of the inhabitants in the nearby farms and villages. The protection provided, however, was not sufficiently effective. The fortification was twice overpowered, the defenders cut down and left where they fell. The survivors of the first invasion tried to strengthen the defense barrier but their efforts were evidently futile and the fortification was subsequently deserted.

The dating of these violent events is relatively accurate due to the artifacts that have been recovered in connection with the excavation. Involved, and of primary importance, are earthenware vessels and weapons, but various utensils and a few bits of jewellery also contribute to the material. Particularly important for the dating is a silver pendant produced in Lund during the period 1134-1137 by Erik Emune's mint

master Alvvin. The dating to the first half of the 12th century is also supported by the pottery finds, including fragments of 25-30 vessels, all of which can be referred to Dagmar Selling's classification A II. With certainty a single vessel can be identified as a so-called »Ringaugengefäss« produced in Alt-Lübeck during the first third of the 12th century.

The interpretation of the small fortification presents several problems. This type of fortification is rare in Denmark, but has parallels south of the Baltic, both east and west of the »limes Saxoniac« – the border between Slav and Saxon areas in the present day East Holstein. The same applies to the majority of excavated material including the pottery. Combined with the curious phenomenon that the slain defenders of the fortress were left where they fell despite the insignificant distance to Magleby church hill which, presumably, has been consecrated ground at least since the 12th century. Another indication can be found in the local name of Vindeby, on Tåsinge and Langeland, which is believed to reflect regular Slav residence in the area – a situation also familiar on neighbouring Lolland-Falster. Close and often peaceful contact has in any case characterized the western Baltic. Should Borrebjerg be interpreted as an expression of erroneous Slav colonization on South Langeland or were the bodies of the slaughtered defenders of Langeland

left unburied because the invading enemy ravaged the island so thoroughly that the survivors were busy saving themselves? It is possible that the answer still lies awaiting in the depths under Borrebjerg.

## »Dancing girl« in Ålborg

*By Else Roesdahl*

Presentation of a medieval jug sherd with »dancing girl« decoration found in Ålborg, Denmark (figs. 1-2). It belongs to a group of sherds of five dancing girl jugs found in Southern Sweden (at Lund, Kalmar, Ragnhildsholmen and Kungahälla, fig. 3). They were published by Kenneth Barton in 1968 as probably South Scandinavian products whose decoration was influenced from the English Midlands, though he emphasized that the dominant influences on South Scandinavian medieval jugs came from the Netherlands.

The suggested English influence on the small dancing girl group is here supported by examples, recognized after 1968, of other elements of English influence on certain groups of South Scandinavian pottery and by examples of English pottery imported into that region. South Scandinavia certainly was interested in and to some degree inspired by English pottery.

## Some Pot Fragments from the Leprosery of Odense

*By Eskil Arentoft*

In 1980-81 the medieval leproseries of Odense was excavated. It consisted of a church with surrounding

cemetery and a number of very destroyed houses. The leproseries are first mentioned in a will from 1291 and it is closed down by the king in 1542. The excavation brought to light quite a lot of potsherds and the larger pot fragments are the subject of this article.

No. I can be coin-dated to late in the first half of the 14th century.

Nos. II-IX all come from the same *spoilpit*. Due to layers above, it must be dated to somewhere between 1275-1325.

No. X cannot be dated very precisely, but the layer, in which it was found, was probably from the 14th century.

Nos. XI-XV cannot be dated from other finds (coins etc.).

No. XIV is a vessel of a type produced around the Baltic (Østersøkeramik). It is probably a little older than most of the other fragments, but it is found in the area along the west side of the leproseries, and this area seems to have been inhabited a bit earlier, as potsherds of this Baltic type is not uncommon here.

Most of the pots have been used in the fireplace and this also applies to the jug No. XI. It is indicated by the traces of soot and incrustation.

Two of the pots have three small legs of a flat type. Pots with circular legs are rather common in Denmark, but not the flat type. They do seem, however, to be well-known in the northern parts of Germany.

## Earthenware from Øm

*By Anemette Christensen and Rikke Agnete Olsen*

During a four year long campaign at the well-known cistercian monastery many finds were excavated and

among these a large amount of potsherds. Every find was immediately registered on a special registration card developed for the occasion.

In the article the earthenware is analyzed from the registration cards, and the results controlled on the objects themselves. The various possibilities for dating and acquiring new knowledge about production and the character of medieval Danish earthenware are discussed and it is shown, that in the 15th century the glazed earthenware jug was very common at Øm – and no doubt at many other places, too.

## A Survey of the Pottery from Sandhagen

*By Lise Bender Jørgensen*

Sandhagen was the name of a small fishing-village, situated near the south end of the island of Langeland during the period c. 1550-1620. The site was excavated 1953-55 and published in detail in 1981(1).

A very large amount of pottery was found during the excavations, roughly estimated about 30,000 sherds, falling into several categories.

Red and yellow earthenware is by far the largest group. The main type of these are pipkins, probably between 1/3 and 1/2 of the total amount of pottery. Only very few actual types were found (fig. 1). These types have close parallels in the material from Danish and Swedish finds (notes 2-4).

Another major group are dishes, either plain yellow or polychrome, ornamented dishes (figs. 2-4, see also the Sandhagen-publication figs. 46-47). Corresponding dishes are known from several other Danish finds (see note 4) and in Sweden (note 7).

A special group are footed dishes (see the Sandha-

gen-publication figs. 49b, 50). Small bowls were also found (fig. 5) mainly of the same categories as the dishes.

Handed bowls (fig. 6-7) also appeared usually in plain yellow or red ware with plain or yellow glazing. Corresponding material is mostly known from Eastern Denmark (8).

Black earthenware was relatively common at Sandhagen (approx. 1100 sherds). Several types were found: 3-legged pots (fig. 8-9), pipkins (fig. 10) with several types of tails (fig. 11), jugs, bowls (fig. 12), small pots (figs. 13-14) and a sherd of a so-called cream-pot (fig. 15). Corresponding material is rare, mostly from Ribe (9).

Stone ware is only a small group at Sandhagen, approx. 300 sherds. Two types of sherds were found: thick, saltglazed sherds, mostly from jugs, and thin sherds, mostly from stone jars or flasks. The former type are almost all of the kind produced in Frechen, only one sherd is of Siegburg-type. The latter type of sherds cannot be determined but is probably from Germany.

Only a small amount of Faience was found, approx. 20 sherds from at least 4 dishes and 2 beakers/jugs. They are all early maiolicas made in the Netherlands (10).

A small amount of other imported wares was found, e.g. one piece of Wanfried-pottery, and several pieces of German or Netherland origin, often in fine white ware close to faience (fig. 17).

*Conclusion:* The pottery from Sandhagen consists of a large group of plain earthenware and smaller groups of stone ware, faience and other clearly imported goods. It is at the present stage of research impossible to determine the origin of the earthenware. It could be Danish, as we know that several Danish towns at this

period had potters, but a close study of a large material of North European earthenware will be necessary before a production pattern of the renaissance pottery can be traced.

## Some Tiles and Potsherds from Renaissance Gilleleje

*By Søren Frandsen*

In the thirties the former keeper of Gilleleje Museum Mr. H.C. Terslin expressed the opinion that the tile finds in the fishing villages of Gilleleje and Krogskilde had to originate from the ruins of the nearby Tinke-rupgård, which was deserted in the second half of the 16th century. H.C. Terslin argued that tiled stoves were uncommon among fishermen, who used to have open fire places. Since the thirties tiles have turned out to be one of the most frequent groups of finds in the excavations at Gilleleje.

In 1978/79 Gilleleje Museum made an investigation at 10, Fabersvej until the eastern drying ground. Under a layer of shifting sand, approx. 1 metre thick, appeared culture layers. At the bottom of the strata a road N-S with fenced-in sites on both sides was found. The boundary between road and private area was marked by postholes with 50 cm intervals. The posts are interpreted as the vertical supports of a wattle.

On the eastern site a 10-15 cm thick mixed sand/clay layer was found, in which a coin struck during the civil war in Denmark 1534-36 appeared. As this type of coin was only in circulation for a short time it must have been lost at the spot around the middle of the century and consequently assists in dating the settlement to the south of the paving which was un-

covered in the southeast corner of the dig. In the brownish culture layer a sherd of pipkins from c. 1500 was found.

The road with adjacent sites was covered by a 2-10 cm thick layer of shells. In this layer fragments of green glazed frieze tiles and tiles with portraits of princes and a coin with the value of 1 mark struck in 1564 were found. Directly on the shell layer a house was erected around the end of the 16th century. In connection with this site fragments of green-glazed tiles with a rhomb-design were found.

The tile fragments are uncovered in layers, the dating of which suggests that around 1500 the fishermen at Gilleleje had quite modern stoves. The explanation is to be found in good fishing during the 16th century, which was reflected in the flourishing trade.

## Pottery from an Excavation in the Western Part of Ribe – imported Ceramics, local Chronology and Dating

*By Per Kristian Madsen*

The paper presents the pottery finds from a small trench in the very western part of medieval Ribe, 50 metres from the moat. A series of layers can be dated c. 1250-1350 because of their contents of redfired, lead-glazed sherds, the so-called »standard-dating« of lead-glazed jugs. In the bottom layers were found sherds of Pingsdorf-ware. All layers contained a striking number of grey, non-oxidized, rather coarse sherds, which seem to have been mixed into the younger layers. The coarse wares are dated to the end of the 12th century or around 1200. This seems to correspond to the results of another, yet unpublished exca-

vation in this part of the town and points to activities in the 12th century, a period which has hitherto not been localized with certainty in most of the town. Future excavations are planned and might show that this area of Ribe, which houses a parish church, known from 1145, the royal castle of Riberhus from at least c. 1200 and important ecclesiastical institutions of the 13th century, might have been re-structured in the first part of the 13th century. This is probably part of – maybe the start of – the framing of High Medieval Ribe, which takes place in the 13th century and which is still to be seen.

The second part of the paper discusses the imported ceramics of Ribe, especially the Pingsdorf-wares and their derivatives, as a basis for the dating of layers and sequences in excavations. It is argued, that the »stand-ard-dating« of medieval glazed jugs, although it might not be too imprecise as a frame, cannot be used without problems. Excavations in Ribe and the general need for comparative material for the study of medieval town topography and history recommend the creation of locally founded chronologies of pottery as regards the main part of the finds, i.e. the grey-fired sherds, mostly from globular pots. It is stressed that the rich finds of Ribe are a part of the pattern around the North Sea and by no means typical of the Danish medieval town.

## 15th Century Pottery from Kolding

*By Vivi Jensen*

A presentation of glazed and unglazed pottery from excavations in Kolding, a town situated in the south-eastern part of Jutland. It is compared with the con-

temporary material from Stakhaven, Dragør (East Denmark), and whereas the glazed pottery is very similar to what was found there, the unglazed, grey pots are peculiar to the Kolding material. As many as five different types can be distinguished, all different from those of the previous period. The black, polished pots »jydepotter« known from all later Danish material are one of the five and soon dominate the material. By the end of the 15th century »jydepotter« are the only unglazed ware in the market.

## Pottery Stratigraphy at Viborg Søndersø

*By Hans Krøngaard Kristensen*

In the fall of 1981 a probing investigation was carried out at Viborg Søndersø. Surprisingly enough the area turned out to have been inhabited from c. 1000 to c. 1350. The lowest layer was 1.3 m below the present sea level. The sea level has thus been raised at some time during the Middle Ages.

The stratigraphy of the dig was rather uncomplicated, so that the various layers could be placed in a relative chronology. Many of the layers were of very limited size and the material has therefore been divided into five horizons. The oldest layers can be dated due to a dendrochronological dating of a house construction (1018). The upper layers can be coin-dated to the beginning of the 14th century.

The investigation shows a development of black ware in Viborg through the period in question. At the end of the period a rather significant contribution of glazed ware is found. By far the most important part of the pottery material was of Danish origin. Imported were for instance some Anglo-Saxon ware from the

beginning of the 11th century; furthermore some late Slav vessels from the 12th century.

## Pottery and its Dating

*By Jan Kock and Per Bugge Vegger*

Medieval Aalborg was situated on an east-westerly ridge, which carried and still carries the spine of the town, Algade. Looking at a level map of the town area with the many streams that surround the town marked on it, it is tempting to search the original siting of the town east of the medieval town centre, as until now no layers from the viking period have been found here (Fig. 1).

A number of archaeological investigations disproves this hypothesis and further excavations in the centre of the medieval town show a settlement here at least from the late viking period (Fig. 2 and 5).

At Roldgyde east of Østerå evident viking age settlement layers are uncovered and the artifacts consist of typical globular pots and a viking type comb (Fig. 4).

West of Østerå at Strandstien a series of houses with mud walls was discovered. Here a series of stratigraphically secured artifacts appeared with absolute dating of the lower layers. The oldest layer is dated by a coin minted about A.D. 1050 at which time Sven Estridsen was king and the layer right above by a dendrochronological test, suggesting a felling date of A.D. 1082.

## Town and Countryside: an Investigation of the Dating and Distribution of the Baltic Pottery on Stevns – South-Eastern Sealand

*By Lotte Hedeager, Bjørn Poulsen and S.Aa. Tornbjerg*

The article presents an archaeological investigation of ten existing villages in an area on Eastern Sealand – Stevns, including the county town of St. Heddinge.

Place names of supposed iron age origin governed the choice of villages for investigation. This was carried out according to the same methodological criteria as employed in a similar investigation on Funen (Grøngaard-Jeppesen 1981. Cf. Hedeager 1982).

Eighty trenches distributed at random in the villages were excavated (size: 3.0 x 1.25 m) plus one large trench in the county town (size: 86 m<sup>2</sup>).

The artifact material was large and varied, pottery from all historical periods making up the major part. This article, however, deals mainly with early pottery of so-called Baltic type, ranging from approx. A.D. 1000-1250. Both forms and style seem to be rather homogeneous throughout the whole period. Thus a chronological division, based on a typological analysis of changing forms, shapes and ornamentation has not been possible. There is further no difference between village and town pottery.

Stratigraphy, coins and carbon-14 datings have therefore been of great importance for the dating of the earliest settlement layers. They show that the present day rural settlements on Stevns, both villages and county towns, have been located at the same place since A.D. 1000-1200.

On this point the investigation on Stevns has confirmed results from other parts of Denmark, perhaps

indicating that we are dealing with a more general pattern of settlement continuity.

## A Medieval Pitcher from Endelave – seen through Reconstruction

*By Lone Schmidt*

Pottery from the Danish Middle Ages expresses an organic connection between material and human need. In the explosive technological development of the early Middle Ages, new aids such as the potter's wheel permitted mass-production of a ware, and kilns which could be heated to very high temperatures were adopted. New shapes appeared, first of all the pitcher, and glazes appear for the first time.

Medieval glazed pottery in Denmark was once thought to be imported, but finds of pottery workshops such as Farum Lillevang and most recently Faurholm near Hillerød (published by Liebgott) show that this was not necessarily the case. Medieval Danish potters could manage very well on their own.

Observing the pitcher from Endelave (belonging to Prehistoric Museum, Moesgård) I will try to describe the process of reconstruction.

The ware of a medieval pitcher is often very thin, only 3-4 mm, so the clay was not placed directly on the wheel, but on a removable plate which made it easier to move the piece later on. After the pot had been thrown, the spout was formed and, while the clay was still relatively soft, a row of fingermarks was impressed along the bottom, the function of these fingermarks has hardly been of decorative nature, but more likely – due to a changed way of living – as the round-bottomed pots from earlier times were put a-

side in sand or between granite stones. Later on when furniture such as tables and benches appear, the bottom of the pitcher was lifted off the plane, resting on the rim of wavy fingermarks.

The handles from medieval pottery are extraordinarily rich, with the various profiles – round, flat, concave, convex. They are simply shaped and placed right there where they belong.

The decoration of the pitcher from Endelave is at the same time strict and free. The so-called raspberry-bud pattern, consisting of tiny clay balls, fastened on to the clay vessel in certain vertical rows with a stamp of clay. Horizontal lines are scratched in the leather-hard clay, while the pot slowly rotates on the potter's wheel.

Medieval sources describe how the pottery was glazed. A powder made of 2/3 of lead and 1/3 of dry broken clay was sprinkled or smeared onto the vessel. A green glaze was obtained by mixing the powder with brass or copper, while various iron compounds made the colour more golden.

The pitchers were fired in »Faurholm-ovnen«. The reconstruction of the kiln was based on measurements and excavation reports, as a result of a collaboration between different museums and my own pottery praxis. Experiments like this, do not necessarily lead to a definite result, but help us to a better insight and understanding of the medieval pottery.

## Lead-glazed Floor Tiles from Sorø Church

*By Birgit Als Hansen*

In 1970 some minor alterations of the floor in Sorø church made it possible for the National Museum to

investigate a small area in the crossing in front of the original choir steps. In this excavation remains of a tile mosaic floor – probably representing the first lead glazed tiles made in this country – were uncovered.

Sorø church is one of our earliest brick buildings and was part of a cistercian monastery founded shortly after the middle of the 12<sup>th</sup> century by bishop Absalon of the rich and powerful Hvide-family. Whereas the bishop's grave in the choir has been investigated several times, the area in front of the steps, where other members of the famous family are known to be buried, was relatively untouched by later disturbances.

The tile mosaic floor covered the only space left over between two burials in a row of carefully built brick graves dating from 1204 to 1233. The floor was composed of rhomboid tiles of two sizes embedded in mortar in a simple pattern (fig. 5-6). The red body-clay was covered by transparent lead glaze and the big tiles were decorated either with a rosette or a quatrefoil impressed on the middle with a small wooden stamp (fig. 7-8).

After the discovery of the floor a series of large tiles of a curious experimental character already known from Sorø found their place in the chronology. These tiles were heavily decorated with different patterns made with small wooden stamps as a free-hand composition only with a few incised lines for guidance (fig. 9-11). A definite link between the mosaic floor and these tiles can be seen in fig. 8 and 11. The quatrefoil stamp on fig. 8 is also used on the large tile fig. 11, only here the wooden stamp has been altered by cutting away two opposite leaves. None of the large »free-hand-decorated« tiles were found in situ, but the technique indicates a probably simultaneous production – and certainly not much later than the mosaic tiles.

The mosaic floor was destroyed by a fire in 1247. Cakes of molten lead from the roof were seen on the surface both of the floor and on several of the large tiles.

In connection with the rebuilding of the church a new type of floor tiles was introduced. Whereas the old ones were cut out individually and laboriously stamped with small pieces of wood, the new relief tiles were the result of a rational production where the tile was made in a mould and the ornament pressed into the clay with a single big wooden stamp.

The products of this tile industry (fig. 1-3) soon became very popular and are found in numerous other churches in Sealand. But it is natural to presume that these glazed relief tiles – among the finest of their type in Europe – were created in Sorø, and are a result of inspiration from abroad combined with a true pioneer spirit and a living tradition for experiments in brick and tile.

## The Tile Kilns from Bistrup

*By Egon Hansen*

The kilns from Bistrup were reconstructed by a voluntary working party on a piece of land belonging to Prehistoric Museum, Moesgård.

The Kiln was built to the scale of 1:0.7, and a total of five experimental firings in the glaze kiln and one in the first firing kiln were carried out. The kilns were built as part of a series of experiments on tile production in the 13th-14th century. These experiments are not yet concluded. In reality only kiln III has been thoroughly tested. It is used for glaze firings.



## Pottery from the Medieval Deposits on Handelstorget – Skien 1979

*By Siri Myrvoll*

Situated on the southeast coast of Norway where the Telemark river network (the ancient communication system) joins the fjord, through the years the town of Skien has been of considerable importance to the trade in the district. The town was known as a medieval centre, and remains of this centre was excavated on Handelstorget in the summer of 1979 (fig. 1).

The site was divided diagonally by a mountain ridge forming a steep cliff to the southwest and a gentle slope to the northeast, where the early medieval deposits were located (fig. 2). The deposits constituted the phases 5-10, and a »pit« or disturbance made during the later half of the medieval period.

Found in the medieval deposits were 55 fragments of pottery (fig. 3) – 29 of blackwares, 21 of lead-glazed pottery, and 5 fragments of stoneware. The pottery belongs to the phases 5,6 and the »pit«. A few fragments from phases 7 and 8 were stratigraphically uncertain and may be attributed to phase 6.

Of the identifiable blackwares, 2 are fragments of the »shelly« ware associated with England. 5 fragments belong to the Slav group, and 4 pieces (fig. 4) have direct parallels in Danish finds from Roskilde and Pedersborg. 4 fragments are of blue-grey Western-European cooking vessels (fig. 5). There were also found two pieces of hard-fired blackware, similar to the pottery found in Denmark from the 13th century onwards.

The lead-glazed pottery was mainly found in the »pit« (only 3 fragments from phase 5), and has been identified as South-Scandinavian (9), Dutch (2) and

English pottery (5 fragments of Grimston and 1 piece of Scarborough ware). In addition 3 fragments were recognized as Saintonge polychrome pottery and one possibly from Andenne. (fig. 3)

5 fragments of early stoneware were also found.

The site's medieval deposits are dated by the pottery and combs. Double-combs of the oldest type (fig. 7) belong to deposits covering phase 5, contemporary with or slightly older than the »pit«. Single-combs of the younger type (fig. 8) are associated with phase 5, while older combs (fig. 9 & 10) of types belonging to late viking and early medieval times are connected with phase 6. This places the digging of the »pit« to some time between the 13th and early 14th century, while phase 5 is set to the turn of the 12th/13th century, possibly a little earlier. Phase 6 belongs to the 12th century.

The pottery material from the medieval deposits in Skien is small, but its contents present some interesting problems as to the town's position during a period where almost no written sources about the place exist. There are indications of contact with districts to the southeast (Denmark/Southern Scandinavia), to the southwest (The Netherlands, Belgium and France) and to the west (England). Although not necessarily a direct contact, the combination of pottery groups gives a clear indication of Skien's relationship to the trade network of Telemark as a trading centre constituting a link between the valleys of Upper Telemark and the »outer world«. The field of contact seems surprisingly wide, considering the lack of royal power behind Skien, the earliest town privileges of which were granted in 1358.

## Some finds of Mediterranean Pottery in central Norway

*By Ian Reed*

The article aims to draw renewed attention to the occurrence of Mediterranean pottery types which have been found in central Norway, primarily from excavations in Trondheim.

From the eastern Mediterranean is a single sherd of a blue alkaline glazed vessel dating to the 14th century (fig. 1.1).

From Italy come two groups:

- a) marbled slipwares from northern Italy dating to the mid-17th century (fig. 1.2 and 2).
- b) tin-glazed earthenwares from the Veneto, of late 16th or early 17th century date (fig. 1.3 and 1.4).

The Spanish wares form the largest group of finds from the Mediterranean. Here there are three distinct groups:

- a) lustreware represented by sherds of two vessels, one in the late Andalusian or early Valencian style of the late 14th or early 15th century (fig. 1.5), the other in the mature Valencian style of the 15th century (fig. 1.6).
- b) so-called Mediterranean maiolica represented by fragments of three albarelli all in hard tin-glazed earthenware with green and brown decor outside and lead glaze inside (fig. 1.7 and 1.8).
- c) coarse wares which can be divided into three main groups: I) the micaceous redware costrels from the Mérida region (fig. 3); II) amphorae and storage jars from the Seville area (fig. 4 and 5); III) green-glazed bowls of which the example from Trondheim differs from the other known examples in that it appears to

be part of a globular vessel decorated with rouletted applied strips (fig. 1.9).

## The Ceramic Finds from Bryggen in Bergen

*By Asbjørn Herteig*

The article discusses the plans for the treatment of the large ceramic material from the extensive excavations 1955-63 at Bryggen in Bergen.

## On the Use of Ceramic Vessels in Norway in the Middle Ages

*By Petter B. Molaug*

No evidence of pottery production in Norway during the period late 10th to 17th century has been found so far. Despite of this fact the amount of pottery found during excavations in medieval towns like Oslo, Tønsberg, Bergen and Trondheim is formidable, making it one of the largest finds' groups. This seems, however, to be a coastal phenomenon, since pottery finds from the only medieval inland town, Hamar, are lacking. Nor have excavations of inland rural habitations brought medieval pottery to light. Some sherds have been found, however, in such habitations on the coast of Western Norway.

When looking closer at the pottery found, it appears to be very scarce in the 11th and 12th century but increases rapidly in the 13th. Whereas the early pottery consists of both cooking vessels and vessels for table use, the main part of the 13th and 14th century pottery consists of jugs and jars, probably for pouring

beer, wine etc. at table. Since this clearly was only a minor part of the range of vessels needed in an ordinary household, most vessels used must have been of other materials, metals and soapstone for cooking, wood for most other purposes like drinking, eating, storing etc.

Wooden vessels are badly underrepresented because of the obvious fact that damaged ones ended up as fuel. The ones being thrown away mostly rotted. Metal vessels had a long lifetime. They could be repaired, and if destroyed the metal would be reused. Soapstone vessels could be repaired too, and broken sherds could find their use as raw material for fishing weights, casting forms and spinning whirles. Despite this fact the amount of plain soapstone sherds in the same excavations is about the same as the amount of cooking pot sherds.

To reconstruct the amount of pottery in use different counting methods have been applied. A simple sherd count is used, reckoning the mean per year and 100 m<sup>2</sup> in different periods. The intensity is very much the same in the Norwegian towns, rising from 0.3-1 in the 12th to 3-6 in the 13th and 14th century. Through measurement of vessel equivalents based upon rim counts the mean amount of sherds per vessel equivalent could be reckoned. This differed from 44 in an early 17th century well to 81 in a medieval habitation area in the Oslo excavations.

If one supposes the same amount of sherds in all the area of Old Oslo, vessel equivalent numbers can be used for reckoning the total amount of vessels thrown away each year. Tentatively the number of vessels in use per inhabitant was only 0.25 using this method (2000 inhabitants, 10 years life span per vessel). Supposing that somewhere in the town area, there are concentrations of pottery with much higher density

than on the excavation sites, for instance rubbish heaps, the number of vessels might have been larger. Using maximum number of vessels the reconstructed amount will be too large because sherds from next to the excavation area have been mixed in during the time. Without taking notice of this mixing, the number of vessels in use per inhabitant was 12 (2000 inhabitants, 10 years life span). The truth lies somewhere between the two extremes, probably nearer the lowermost number.

It is likely that the increased use of ceramic jugs in the 13th century was caused by the adoption of new drinking habits from abroad. In the same period there was an increase in the amount of imported beer and wine. The pottery reflects, however, not especially connections with the export area of these products, but more the general trading connections.

The next large increase in the amount of pottery came in the 16th and 17th century. Now especially pipkins, bowls, panchcons, saucers and dishes dominate, outnumbering jugs and drinking vessels relatively. The number of sherds in excavations in 17th century Oslo is about 10 times as high as in the high medieval period reckoning mean number per year. This century is the first when a larger part of the household equipment in the coastal regions of Norway was of pottery, leading to the restart of Norwegian pottery production after a pause of 1000 years.

## Base Marks

*By Leif Stenholm*

One question concerning the large quantities of old black earthenware found in excavations at Lund is

whether the pottery was made locally at Lund or imported from Slav areas. In this article the problem is approached via the so-called base marks sometimes found on the exterior bottom of the vessels.

These base marks fall into two categories: Category A consisting of marks which are direct traces of the process of manufacture and category B, consisting of marks which have been deliberately applied, often in the form of a geometric figure.

The old black earthenware seems to have been produced by a clearly specialized group of craftsmen, and the base marks in category B are most likely the maker's signature. As almost all of the identifiable base marks in the material from Lund have also been found in Slav areas, it is very probable that the material at Lund is imported. This import of pottery would thus have begun around the year A.D. 1000 and continued until the middle of the 12th century.

## French Ceramics from Lödöse

*By Kristina Carlsson*

Already during the twelfth century Lödöse was one of the most important trade towns and the only port on the west coast of Sweden.

A lot of imported ceramics is noticed in the archaeological material. Potsherds of English, French and German origin appear starting at the end of the twelfth century.

Although they are scarce (about one per cent of all the potsherds found in Lödöse), different types of ceramics from France indicate contacts between the countries.

The oldest types from the northwest of France cal-

led Andenne ware were imported to Lödöse during the last part of the twelfth century. One specimen, of the same type of ware, is found together with other objects from the end of the fourteenth century. These sherds belong to a pot, identical with another one found in Sandgravvold in Denmark.

About fifty years later than the Andenne ware, ceramics of Rouen-types were introduced in Lödöse. Even some products from Saintonge in the southwest of France are found in Lödöse. Why and how they were brought here is not known. They are all except one of the specific polychrome type produced only in Saintonge, and not found anywhere else in Sweden. Identical pots are found for example in Lesness Abbey in England. The Saintonge ware in Lödöse is dated to the end of the thirteenth century.

## Late Medieval and Renaissance Pipkins from Helgeandsholmen in Stockholm

*By Anders Broberg*

The following study concerns a group of three-legged, redfired earthenware jars with straight tubular handles. A vessel-type that is a common find in culture layers from the 16th and the 17th centuries. As they were mass-produced and contain several typological elements they might be usefull as a dating-instrument.

The material for this study all comes from the large excavation at Helgeandsholmen in the centre of Stockholm (1978/80). During the high and late Middle Ages this small island contained a hospital and an almshouse, institutions that were seized by the crown at the time of the Reformation (c. 1530). After the Reformation the area was used by the crown for hou-

sing the royal stables, the mint, an arsenal and other official institutions. Since 1905 the parliament has been seated at Helgeandsholmen and it was because of a rebuilding of the old parliament that the large rescue-excavation was started in 1978.

All dating of layers or structures are based on the coin material since no dendro-datings are available at present.

Black earthenware jars on three legs with small rod-handles appear at Helgeandsholmen during the late 13th century and from the middle of the next century we also meet three-legged, lead glazed jars in redfired ware.

Around 1380/90 there also appears a new type of three-legged jars with a straight, tubular handle. This vessel-type in glazed redfired ware has two variants, type A and B (fig 3/4 and 6/7), which both have an almost trumpet-like handle (fig 5). While type A disappears around 1400, type B continues to live during the whole of the 15th century.

About 1500 we meet a new variant, type C (fig 8/9), with a straight handle and at the base of the handle two distinctive thumb-marks on the vessel-body. This is an element which is common both during the 16th and the 17th century.

By the end of the 16th century another type of three-legged jar appears, type E (fig 13/14 and 15). This variant with its typical »knopp« (swedish) at the end of the straight handle is to be the dominating type during the next century. From the end of the 16th century the interior leadglaze gives a more metallic impression than before.

The youngest type of three-legged jar, type F (fig. 16), is only found in the cellars of houses broken down in 1674 where it appears together with type E.

Compared with ceramic debris from local potteries

in Stockholm from the 16th and the 17th centuries it is clear that most of the redfired earthenware from these centuries found at Helgeandsholmen was produced locally.

## Some Technological Aspects of medieval Ceramic Products

*By Anders Lindahl*

Ceramic technology is the act of processing raw materials in order to produce ceramic products. The main raw materials are clay and temper. Colour pigments for paint and different kinds of oxides for glaze are also to be considered raw materials.

Examples of technological analyses are:

Documentation and statistical evaluation of numerical values.

Results of petrological microscopy of thin sections illucidate problems concerning structure and type of clay and temper material.

Thermal analysis serves as a base in order to determine the original firing temperature and sintering interval.

Estimation of apparent density and water absorption.

Determination of hardness and measuring of index of refraction of glaze.

Technological analysis on ceramics has to be thoroughly planned within limits of problems, time and economy. To extract maximum information from the material several different analyses are required.

Traditional ceramic research is mainly based on typological elements, that is vessel shape and decoration. These are mobile elements that can easily be

copied. Manufacturing techniques and the use of raw materials on the other hand are closely related to its production centre.

It is essential that the classification of pottery is based on well known criteria. Fig. 3 gives an example of a model for classification of medieval pottery. The basis of the model is degree of sintering, firing methods in reducing or oxidizing atmosphere and presence of glaze.

During the Middle Ages a number of technological innovations within the ceramic field reached Scandinavia. Among these are the kiln with separate furnace and firing chamber, glazing technique, brick manufacturing and the potter's wheel.

Temper is used to prevent cracking due to heavy shrinking. Temper can either be a natural component in the clay or added as sand, crushed rock or chamotte.

Observable effects of firing are e.g. an initial firing in reducing atmosphere followed by a glaze firing in oxidizing atmosphere. In this case the vessel made of a red firing clay will have a grey-black – brownish core with a brickred inside. The transparent glaze on the outside obtains a greenish colour due to refraction phenomena and the underlying dark ware.

Stoneware requires a clay with a longer sintering interval and higher melting-point than clays normally used in earthenware production. Near stoneware can be manufactured by means of a mixture of stoneware and earthenware clays.

In brick manufacturing where large amounts of clay are required, local sources are most probably

used. As well as pottery, brick-ware has to be tempered. Analyses on chamotte-tempered bricks indicate that a gravel- and sand free clay for chamotte was produced by means of sedimentation. Even silt has sometimes been removed. Bricks with a surface fired to 1000° C but where the temperature of the core has not exceeded 500° C indicate an insufficient firing time. Reasons for this may be lack of fuel, lack of time, ignorance or carelessness.

The change in ceramic manufacturing from a pure home handicraft to a workshop production, with new markets and channels of distribution has probably had deep social effects far beyond the walls of the workshop.

## Bellarmines in Finland

*By J.-P. Taavitsainen*

The Bellarmine jugs and their fragments found in Finland are presented in this paper. The earliest fragment can be dated to the end of the 16th century and the jugs were used in coastal towns and parishes in their immediate neighbourhood in the 17th and 18th centuries. A mould with a bearded figure (fig. 5) found in Lappi in the province of Turku and Pori is described. It suggests that Bellarmines were more common in Finland than the small number of jugs gives reason to assume. It is also suggested that the mould was used for making bearded heads for the jugs and that Bellarmine jugs were made in Finland.