

English Summaries

The Stone-cutter's Pick

By Ulla and Vitus Nielsen

The pick has only been replaced by compressed air machinery in recent times. Last employments: the Old Due Odde, Bornholm (1879) and the Kiel Canal (1895). The pick was well-known by the time of the birth of Christ (Feldsberg by Odenwald) for adapting the surfaces of stones, picking holes and grooves etc. Mention is made of the quality of the granite rune stones in Denmark, the astounding ability of the cutters, the iron material of the pick and its value.

Is it possible to write with a pick?

By Erik Moltke

The character of the runes of the primitive nordic inscription on the Himmelstadlund rock in Sweden, and of the contemporary »helleristninger« (petroglyphs), lead the author to the discovery of the technical execution of the runes and figures: they were cut not with a chisel, but with a hammer – the so-called pick (German Spitz-Fläche). This method of cutting runic letters and ornamentation can be followed from

the primitive nordic inscriptions down to our own time. Examples are illustrated. We do not know whether the craftsman who cut the runes could read and understand what he »wrote«. His title was *smiþr*, and he was in the service of a grandee, but whether he was a slave, a freedman or a freeborn man is unknown to us. Sote, who cut the runes on the Glavendrup stone, tells us that he made them to his Lord, and Ravnunge-Tue cut runes and constructed a barrow together with Funden and Gnyple (typical slave-names) to his Lady.

A Romanesque oil lamp from Ribe

By Jens Vellø

An archaeological find of an oil lamp from Ribe is compared with similar lamps from Gotland. These, like the Ribe lamp, are made of sandstone and have three holes. The new find supplements the other Danish romaneseque oil lamps, cut from granite, which were described in *Hikuin 3*. Besides the Ribe lamp, information has come to light since this last study of lamps from Måbjerg, Rørbæk, Kisterslev and Selsø, so that the distribution of these early medieval lamps is now as shown in fig. 1. While the lamps normally

have an ecclesiastical connection, it is not impossible that the Ribe lamp occupied a place in the house of one of the prominent citizens of the city while the cathedral was under construction.

Abbot Søren's Stained Glass Window from Øm Abbey

By Mogens Vedsø

After the completion of the excavation of the west range of Øm Abbey in 1978 it was clear that this part of the monastery could not have been built before about 1500, and it is known that King Frederik I destroyed the building in 1561.

This demolition was very complete, sparing only parts of the foundations and small parts of the brick walls. In this area over 5000 fragments of window glass (among other things) were found. More than half of them were fragments of stained glass windows, and after registration it was clear that 31 fragments from the northern part of the west range were characteristically different from the others. The contour lines were painted in light grey on the light greenish glass, and parts of the glass were covered with a thin translucent layer of stain.

These fragments all come from the same circular pane, which was about 16.8 cm in diameter. Of the design on the pane we are able to reconstruct an asymmetrical coat of arms with an arm holding an abbot's crozier. Partly covering this design are four curving lines of inscription, which can be reconstructed except for the final part: »Frater Seue(rinus) ab-

ba(s) in ...r (or »e«)«, friar Søren, abbot in ...

Because of the coat of arms and the form of letters employed the window must be dated to the period about 1500 to 1530. The monastery had more than one abbot named Søren, but one, mentioned in 1495, 1509 and 1519, is particularly prominent, and it is reasonable to suppose that this is the one who built the west range and had his name placed on one of the stained glass windows.

A Mediaeval Bench from Ribe

By Hanne Dahlerup Koch

The article describes a bench which was found in the storehouse at Ribe Cathedral; it is now in the National Museum. The bench has been heavily restored. A complete new front section was inserted, and one of the two end pieces has also been replaced. It is impossible to say whether these new pieces are copies of the original ones. The rest of the tracery of the bench is either original or a true copy. It has not been possible to find any direct parallels to the Ribe bench; judging from its construction and ornamentation it must be dated to around 1400-1550. It seems likely that the Ribe bench is a domestic item, and several possible uses are mentioned: Priest's chair, bridal seat, church bench, or simply in an ordinary living room. In connection with the discussion of the lions on the bench four Danish parish clerk's chairs from about 1500 are mentioned; these all have a carved lion, lying on top of the pediments.

Chrismatories for only two types of oil

By Thomas W. Lassen

Examples of normal medieval chrismatories with spaces for each of the three holy unguents are described (fig. 1 and 2), and a special type with only two spaces is introduced. Only three examples of this type are known from Scandinavia: one without provenance in the town museum »den gamle by« in Århus (fig. 3 and 4); one from the church at Nørre Omme in western Jutland, now in the National Museum, Copenhagen (fig. 5); and lastly one found in Visby on the island of Gotland (fig. 6).

Chrismatories with only two spaces are discussed, and the type is identified as specifically baptismal. Containers of this type are mentioned in an inventory from the Church of the Trinity (Trefoldighedskirken) in Uppsala from 1519, »pro crismate oleo Sancto combinata«. Fig. 7 shows a baptismal scene from a German altarpiece in which the apostle Paul is anointed with chrism.

Two medieval Figure-candlesticks

By Ole Schiørring

The article presents two Danish finds of candlesticks, which are formed as small men dressed in the height of fashion. That found in Svendborg (fig. 1 a + b) on Fyn is a standing figure holding the candles in both hands, while the other, found at Næsbyhoved Castle (fig. 2 a + b) is kneeling with one arm stretched out

for the candle. From their dress the candlesticks are dated to around 1400 or the following decades, and belong to a very large group of similar candlesticks from the European area. Both in Flanders and in southern Germany, centred around Dinant and Nuremberg, candlesticks of this sort were mass produced and exported all over Europe.

The two Danish candlesticks may well have been made in Denmark; they certainly do not have the same quality as their European counterparts. The custom of making candlesticks in the form of men of fashion continued throughout the medieval period and for a century thereafter. The article concludes with some 16th century Danish candlesticks, all having very close parallels in Europe, and which must in many cases have been imported.

Medieval sundials from Denmark

By Jens Velleu

The find of three granite slabs with carved lines on from Ødis church is interpreted as the remains of a large medieval sundial. A reconstruction of the sundial is attempted on the basis of known sundials from Europe (Germany and England), and it is set in relation to the other medieval examples known from Denmark: *Vestervig*, *Flade*, *Skrave* and *Vejrum*. The last-named, hitherto unknown, certainly marks the canonical hours – as is also the case for the *Vestervig* sundial. Mention is made of examples from Sweden, where the existence of medieval sundials has not hitherto been recognized.

Some figured silkweavings from Danish relics

By Else Østergård

During technical analysis of textile fragments from relics in the National Museum in Copenhagen, 4 pieces were discovered to belong to the same category: weft-faced compound twill, with a pattern of typical Sassanian style, which is medallions with row of pearls. The fragments here discussed are too small to show a complete unit of the pattern.

These pieces of textile were used as wrappings for the small relics, which came to Denmark from Rome, Byzantium and Palestine – it is uncertain where they were originally »manufactured«, although they do have a uniform appearance. The odd bits and pieces are probably of secondary use in the relics.

Figured silkweavings like these arrived in Denmark during the Viking era, as shown by the Mammen find. From the early middle ages very few examples of weft-faced compound twill have survived in this country, which is what makes these humble fragments particularly interesting.

Medieval coins as historical sources

By Kirsten Bendixen

If handled with care and critical evaluation coins may present much information to supplement the written sources of Viking age and medieval history. The study of numismatics is an old science, and of course there are examples of misinterpretation. Here mention may be made of the oldest coin bearing the name of a Danish king, *Sven*, dating from about the year 1000.

There is today no doubt that this refers to Sweyn Forkbeard, but in the early eighteenth century this identification was rejected on the grounds that the »portrait« does not show a man with a forked beard! A medieval coin from about 1100 has been used as evidence for well-founded royal power being exercised by a pretender. This argument has been used up to the present day, but it is due to an old misinterpretation of the bungled inscription round the portrait (OLVF for NICOLAUS).

A special value connected with coins is their use as a means of dating towns, market places, houses, burials, ceramics etc. The most important example of recent work has been the dating of the foundation of the oldest phase at Ribe in southwestern Jutland to the beginning of the 8th century. The coins found in the workshops and in the rubbish thrown outside the houses are Frisian sceattas. Their period of international circulation can, by means of comparative studies, be limited to the period 720-750. The sceattas from Ribe arrived there during this period but may have remained in local circulation a little longer.

The sceattas, and the oldest Danish coins dating from about 800 which imitate the type, tell us that coins were in circulation in parts of Denmark earlier than is usually believed.

Other examples of dating are mentioned in connection with monasteries and burials.

Besides giving a great deal of information on trade connections, coins also tell us about the kings' financial policies. Minting coins was for long periods a royal prerogative, and the king could debase the coinage as he liked. An important source of information about coins in circulation among the common people is the examination of many coins lost on church floors over hundreds of years.

German bracteates in Danish hoards

By Jørgen Steen Jensen

The excavation of Aggersborg church in 1976 brought to light two fragments of German bracteates (figs. 1 and 3), which – with the kind assistance of Dr. Bernd Kluge, Berlin – were identified as probably coming from Lower Saxony, one of them perhaps from Hildesheim (fig. 1), and as dating from before 1220-30. Bracteates as a type have their origin in Mark Meissen c. 1130, and use of this special type of extremely thin, one-sided silver coins then gradually spread westwards and northwards, reaching the rivers Weser and Main in c. 1180/90. Bracteates often have a diameter of 4 or 5 cm and a high standard of craftsmanship, but from c. 1220 their size and quality gradually decrease. From the middle of the 13th century they are rather like »Hohlpennige«, a German type of small bracteate which was of importance for a couple of centuries.

We know of four hoards including German bracteates from within the historical borders of Denmark, all found over one hundred years ago. Three of them have been published by the doyen of Danish numismatists, Georg Galster.

1. The Øster Uttrup hoard (from near Aalborg, formerly called the Aalborg hoard), deposited c. 1157, found 1696. The hoard is important because of the many small Danish bracteates it contains, coming from Jylland in the 1150s, but it also has at least seven or eight, and probably more, German bracteates (figs. 4-11).

2. The Bünstorf hoard from South Schleswig, deposited ca. 1225, found 1827. It contains 4- or 5.000 bracteates distributed among 301 different types from

a great many places in northern Germany. Even if Bünstorf from a formal point of view was Danish, the district was already inhabited by Germans at the time the hoard was deposited, and the composition of the hoard has parallels in northern Germany.

3. The Östra Tomarp hoard from Scania (now southern Sweden, part of Denmark until 1658), deposited ca. 1225, found c. 1775. 11 bracteates known (figs. 13 and 14).

4. The Kämpinge hoard, from near Falsterbro, Scania, found 1848. It includes at least 75 German bracteates. The hoard was registered in Stockholm and has never been examined in detail, and the possible identity of this hoard with a hoard »found« by the German numismatist R. Gaetgens in the trays of the Kungliga Myntkabinettet (the Royal coin collection) in Stockholm is dubious.

The bracteates from the Ribe hoard I, deposited 1247, are, as mentioned for examples of this date, more like Hohlpennige (figs. 15 and 16).

A few single bracteates have been found, four of which are mentioned (figs. 17 and 18).

It may be concluded that German bracteates of the 12th and early 13th centuries were not in daily use in Denmark. The two Aggersborg bracteates indicate, however, that in the area round the Limfjord this type of coin may have had a certain importance, and that the bracteates of the Øster Uttrup hoard are not a completely unique phenomenon.

Even if German bracteates were not very common, the technique of manufacture was known in northern Jylland in the 1150's and 1160's. The bracteates struck in this period were sometimes inspired by German patterns, and were probably struck by Germans in the service of the Danish king.

Finally a bracteate stamp is discussed (figs. 19 and

20). It is said to have been found in western Sjælland in the 1890's, and it is generally agreed that it was intended for bracteates of ornamental use, not for real coins. It depicts a bishop, and its design may have been inspired by bracteates of the archbishop of Bremen, Hartwig I von Stade (1148-1168) (figs. 21 and 22). Georg Galster has suggested to the author that it may have been intended for a relative of the Danish King, bishop Valdemar of Schleswig, who was elected archbishop of Bremen in 1192 and again in 1208. After 1192 he spent 14 years in the Danish state prison of Søborg in northern Sjælland. Even if this explanation is tempting, nothing can be said with any certainty. It may also be a combination of two patterns, the above-mentioned Bremen bracteates and a Magdeburg bracteate of c. 1160 (fig. 23). The date of the stamp is proposed to be 1160-1200.

A smith's signet from Bornholm

By Jette Arneborg Pedersen

In 1828 a small circular pendant of bronze was found in the Almindingen Forest on the island of Bornholm. The central motif is a shield, upon which are placed the most important tools of the smith: a hammer and a pair of tongs.

All around the motif is the following inscription, written in majuscules: SIGILLUM RUNG FABER – the smith Rung's signet.

Because of its form the signet must be dated to the middle of the 13th century.

It is difficult to say what kind of a smith Rung was, because in the mid 13th century the term FAVER was still used by various kinds of craftsmen working with

metal; perhaps Rung was a blacksmith. Impressions of similar, but later, signets owned by craftsmen are known from medieval church bells, upon which the bell founders impressed their marks. Rung's signet is unique, as it is the oldest known craftsman's signet from Denmark.

It is today kept in the National Museum in Copenhagen, Museum no. MDCCCLIV.

Fourteen brooches from Kolding

By Vivi Jensen

In 1908 fourteen brooches were found in the town of Kolding during investigation of what was probably the remains of the medieval leprosy hospital, and possibly the chapel attached to it. The brooches are all identical, are made of copper alloy, and have the inscription AVE MARIA stamped onto their surface. Other similar brooches from Denmark are presented.

This type of brooch was in use throughout the middle ages, but the majuscules of this particular group suggest a date about the year 1400.

A new find of a sword from a grave at Øm Abbey

By Lis Nymark

In 1977 a grave was found in the northwest part of the former churchyard belonging to Øm abbey. The grave contained the skeleton of a man buried with his sword. Other items found in the grave were two buckles and a scabbard chape.

The sword is a large two-handed example with a total length of 118 cm. The hilt is long and slender, the pommel octagonally spherical, and the cross-guard curved with both ends curled into a roll. The blade is long and rather broad, capable of being used for both cut and thrust.

To date the sword one must refer to the normally used typology of Danish medieval swords: A.B. Hoffmeyer, *Middelalderens tveæggede sværd*. The closest parallels to the Øm sword to be found in this typology are Hoffmeyer's groups Va and VI, both dated to the late 15th and early 16th century, which must therefore be the dating of the Øm sword as well.

Resemblance to two swords in Hoffmeyer's group IVb (dated to the late 14th century) is in the author's opinion due to the fact that Hoffmeyer has placed these two swords in the wrong group, her classification being based only on their hilt type and not on the sword type as a whole.

The Øm sword belongs to a small number found in graves. The custom is well known from medieval Europe, and from Denmark about 20 examples are known. Most have been found in monastic churches of the Franciscans, Cistercians and other orders, popular burial places in the middle ages, particularly in such prominent places as the choir. Unusual in this respect, the Øm grave was situated in a rather non-descript position in the churchyard.

Norse artifacts from the Western Settlement area of Greenland

By Claus Andreassen

The purpose of this paper is to draw attention to the

quantity and nature of the Norse artifacts in the Greenland provincial museum. Mention is also made of objects from two excavated farms, as they will presumably be crucial when establishing future chronologies. The farms are V48 Niaquassat and V54 Nipaitsoq. The Niaquassat midden ranges in time from the early 11th to the mid 14th centuries. The excavated rooms at Nipaitsoq are dated to the first half of the 14th century. The continuing analysis of the 2 m. deep stratified midden at Niaquassat will probably allow the establishment of three horizons. At the moment it can only be said that among the *combs* we find double rowed types in the upper half and single rowed in the lower. The point of change seems to coincide with C 14 dates of c. 1200 AD (fig. 3). One type of *soapstone lamp* can be assigned to the later phase of the Western Settlement: a bowl with a perforated truncated cone (fig. 4). *Bodkins* are divided into 3 groups: with flat handle, needles, and with V-shaped handle (fig. 5). One of the latter has a runic inscription: LIOTR A MIK, or »Liotr owns me«. Group 3 examples are found only in the rooms of Nipaitsoq. *Coat of arms*: a unique find with no parallels in Scandinavia. Possibly it depicts the arms of the Scottish clan McCambell. Found at Nipaitsoq, room VI. The rest of the finds are mostly fragments of soapstone vessels, among which is a handle with two inscriptions, one in runes and one in minuscules (fig. 7,3 and 10); they also include a huge cooking pot (fig. 11), fragments of church bells (fig. 12) and a wooden coffin from Ikigait=Herjolfsnæs in the Eastern Settlement area. Most of the finds are stray. The Norse farms are mostly situated a bit further inland than are the Inuit sites and are better preserved because they are not exposed to erosion by the sea, and are normally covered by a thicker layer of earth. Because of this the museum cannot expect ma-

ny new Norse finds compared to the amount of Inuit artifacts received.

Medieval comb production in Schleswig

By Ingrid Ulbricht

During the 1970-78 excavations of the old medieval centre of Schleswig some 50,000 very well preserved pieces of bone and antler were found, including a large number of combs, pins, gaming pieces and skates, as well as raw material blanks and fragments of production waste. This gave an opportunity to study a comb making industry, of which a close study had already been made at the Viking town of Hedeby, the immediate predecessor of Schleswig. Change in raw material from antler to bone could be observed, which was directly related to a change particularly in comb types, and to the possibilities of making new kinds of objects from bone.

Though bones of a variety of domestic animals were present in great quantity, manufacturing was restricted to a very few anatomical elements well suited to particular jobs.

Diversified production, systematic methods of workmanship and the supply of antlers and particular bones from particular animals, and also the use of horn, all suggest the presence of a specialist worker, whose daily life and social conditions may be studied by means of his industrial waste. This paper thus has implications of more than purely local relevance.

Passion for games and gambling

By Fritze Lindahl

Chessmen, draughtsmen and dice have turned up in nearly every archaeological excavation of medieval sites, including churches. Different sorts of games and gambling feature in medieval literature and art, and are often given particular symbolic meanings. They could for example be used to illustrate the difference between *sapientia* and *fortuna*, i.e. wisdom and virtue as against chance in human life. We find examples in a fragmentary mosaic pavement from the choir of San Savino in Piacenza (published by William L. Tronzo in Gesta XVI), and in the cross-vault of Ringsted church, where the Danish king, Erik Plovpenning, is shown gambling before being murdered by his brother. From a beautifully illustrated book about chess, written in 1283 by the Spanish king, Alfonso X of Castile, we have evidence of how highly regarded chess was even in those days. The queen of Norway, our Queen Margrethe I, is recorded as having presented an archbishop with a chessboard and set of chessmen.

Very fine specimens made of walrus ivory have been acquired by the National Museum of Denmark from Ole Worm's collections, the Royal Cabinet of Curiosities, or archaeological excavations. From the Vordingborg area four medieval chessmen, three draughtsmen (see especially that in fig. 4, a draughtsman of walrus ivory, English, School of St. Albans?) and thirteen dice have come to the National Museum. Various chessmen are illustrated in fig. 2 and figs. 5-10. The function of some of the pieces has been difficult to ascertain, and their place of origin may also be in doubt as such small items are so easy to

transport. In the period around 1600 there seems to have been a romantic tendency to make chessmen resemble medieval warriors, for instance the lion-mounted knight in fig. 8, which has an inscribed date of 1251, which cannot be true.

Turned wood from medieval Ribe

By Peter Wagner og Mogens Bencard

The paper presents turned wooden objects found in Ribe's medieval layers over the years. The material is presented jointly by a wood-anatomist (PW) and an archaeologist (MB) with the purpose of showing the possibilities of interpretation such a collaboration holds. Diagnosis of the type of wood shows which wood – local or imported – was preferred for different objects. Also determination of the way in which the object is placed in the wood shows the turner's ability to use his raw material and consequently his degree of professionalism. Admittedly, the Ribe-material is not extensive enough to draw wider conclusions, but tendencies towards a well developed craft seem clear enough. The paper must be considered as an invitation to colleagues to treat similar material in the same fashion, with the purpose of making this group of objects a better source in the interpretation of medieval society.

The material contains 35 bowls and plates (complete and fragments). Of these 16 are made of ash (*Fraxinus*), 8 of maple (*Acer*), 5 of birch (*Betula*), 2 of alder (*Alnus*), 1 either alder or hazel (*Corylus*), and 3 of beech (*Fagus*). All pieces are placed in the raw material as shown in fig. 1, B or C. The majority is of the

first variety, which means a more difficult way of splitting the wood. Most of the objects have their bottom towards the bark, which makes a more stable bowl or plate. If turned from a piece of wood placed horizontally, the bowl or plate would crack very quickly.

The fact that the more difficult way of taking wood out of the raw material (fig. 1.B) is used shows, together with other evidence, a good knowledge of the wood and a well developed craft.

4 fragments of refined drinking vessels are made of burr wood. Metal nails in one fragment (D 252) show that this has been mounted. Elm (*Ulmus*) seems to be the raw material, but it is not possible to diagnose the wood with certainty.

Of the 5 handles, 3 are made of boxwood (*Buxus*), one (doubtful) handle of beech, and the fragment of a knifehandle (D 316) of masered birchwood. The principle of preparation is shown in fig. 1. D.

3 cylindrical gaming-pieces are made of boxwood, as is the gaming piece or spindle-whorl (R 17156). The coneshaped gaming-piece cannot be diagnosed, and of two more doubtful gaming-pieces one is made of maple and one of yew (*Taxus*). The latter is placed in the wood as shown in fig. 1. C, the rest of the cylindrical pieces as in fig. 1. E.

Of lids 1 made of ash is more complicated in shape, but badly preserved. The other 3 are flat-topped and on the bottom have a ridge to fit the mouth of the vessel. Of these, 2 are made of alder, and one of beech. They are positioned in the wood as in fig. 1.E.

3 possible fragments of furniture are made of beech, maple and ash.

Of the miscellaneous pieces can be mentioned D 238, made of boxwood and identified as a cooper's measuringrod. A runic inscription on a similar piece found in Gl. Lödöse, Sweden, indicates the function.

The position in the wood is as in fig. 1. D, away from the pith.

A barrel-shaped miniature vessel (D 1656) is made of maple. The inside shows a screw thread. A fragment of a large vessel is made of maple and as its position in the wood lies between the pith and the bark, it must have demanded a very large piece of timber. 2 pieces (D 1655 and R 25040) are waste from the turner's workshop and prove the presence of the craft in medieval Ribe. One piece is made of ash, which grew locally, and the other is boxwood, which is not locally native. It cannot, however, be established whether the wood was imported, or whether trees were imported to grow locally.

In general it can be said that the choice of wood for the individual objects does not differ from what would be chosen to-day.

In search of a medieval potter from Ribe

By Per Kristian Madsen

The article presents an old find of medieval ceramics, consisting of sherds from 4 glazed jugs and at least 5 globular pots from Ribe cathedral. These vessels probably served as funerary pots, originally containing charcoal and incense, which were used at funerals in the middle ages. A parallel find made in the 18th century shows that this custom was in use at Ribe in 1259, when King Christopher I was buried in the cathedral high choir.

The four lead-glazed jugs are part of a group of at least 20 such glazed jugs, all but one of which have been found at Ribe. These jugs are characterized by their brick red ware, which is found in almost all the pieces known, and especially by an unusual type of inclusion in the clay, consisting of white grains, probably of quartz, measuring up to about 1 cm across. These were most probably present in the clay when it came from the claypit.

At least two of the jugs here mentioned are clearly misshapen and somewhat damaged during firing, which leads to the conclusion that these jugs, and for that matter the whole group, are local in origin and produced somewhere in the Ribe area. It is hoped that this will be resolved by future analysis of the clay and inclusions and comparison with local clay deposits round Ribe.

All the dating evidence points to a date for the group of after 1300. This is based among other things on the fact that several of the jugs were found in layers also containing saltglazed Rhenish stoneware. The local potter, producing his wares in the first half of the 14th century, probably together with other unknown workshops, may actually have tried to compete with the mass importation of stoneware. Judging by the results of his efforts, his success seems rather doubtful. Further research into the medieval history and archaeology of Ribe might help to elucidate the position of the local production of earthenware, in which an influence from the Netherlands and England can be traced. Some later clay products, including some of post-medieval date, seem to contain the same sort of white inclusions, which could indicate that the same claypit was in use for a long time during the middle ages, or that it may possibly have been re-opened at a later date.

A Medieval Brick- and Tile-Industry at Bistrup near Roskilde

By Birgit Als Hansen and Morten Aaman Sørensen

Over the past hundred years Roskilde Museum and the National Museum have occasionally received finds of brick and tile wasters from a kiln site on a small hill a couple of miles north of Roskilde on the western shore of the fiord. The area named after the medieval village Bistrup (Bishop's Thorp) is known to have belonged to the bishops of Roskilde from the end of the 12th century to the Reformation, when the king took possession of all ecclesiastical estate. Today the kiln site is part of a modern farm, and the intensified cultivation of recent years has brought an increasing number of brick and tile wasters to the surface. In order to prevent further destruction of what might prove to be kilns an excavation was commenced in 1975.

A few trenches across the top and down the south-eastern side of the hill revealed numerous very compact and thick layers of waste-material and a cluster of four kilns near the hilltop (Fig. 5). The rich variety of the brick and tile material in the layers and the remains of different productions in the kilns testified to the long term use of the hill for this purpose, and there was good reason to believe that the located kilns were but a minor part of the total kiln-activity in the area.

The four kilns were placed so close together that older structures had been damaged or partially destroyed to make room for newer ones. This made it possible to establish a relative chronology between the kilns. Two of the kilns – the latest and the oldest –

were ordinary brick-kilns, while the other two had been used for the baking and glazing of floor-tiles.

The latest brick-kiln was a fairly well preserved rectangular construction (6,70 m x 4,10 m) with four flues in the front wall and a corresponding number of fire-channels divided by low benches for the stacking of bricks (Fig. 6-7). The amount of often very extensive repair to the brickwork indicated that the kiln had been in use for a long time. The waste-material in the kiln and stoke-pit consisted of bricks, unglazed floor-tiles and roof-tiles of the wing- or pantile type, which seems to have replaced the medieval over-and-under-tiles during the first half of the 16th century. In the course of extending the excavation to determine the length of the front wall, a little domed baking oven (V) was discovered. It was built at right angles to the eastern end of the front wall as a small appendix to kiln I.

The greater part of the oldest brick-kiln (II) was demolished when kiln I was established. Only the west wall and one fire-channel remained to show that the construction here was similar to that of kiln I. Among the waste-material in the stoke-pit were many fragments of plain roof-tiles or beaver-tail-tiles of at least two different types, one partially glazed. A layer of powdery lime on top of the usual thin layers of ash, charcoal and brick-dust at the bottom of the stoke-pit seems to indicate that kiln II had been used for lime burning in the last period of its use.

Kiln I and II are typical examples of brick-kilns in this country. The majority of the excavated kilns from the Middle Ages and later periods have the simple construction of an open brick box, where the green bricks themselves are used to establish the necessary fire-tunnels. Only a very small group of kilns have permanent fire-tunnels built of parallel rows of brick

arches, as known from Roman kilns and from a number of English tile-kilns.

The two tile-kilns (III and IV) had no similarity to the English variety, but their function was made abundantly clear by the great number of glazed and ornamented floor-tiles in and around both kilns. Though very different in construction the kilns were evidently built and used simultaneously (fig. 11-12). Kiln IV was rectangular (3,00 m x 1,15 m) with a level floor and vertical walls, while kiln III was oval (3,15 m x 2,35 m) with a sloping floor and remnants of a covering dome. Part of the stoking-area in front of the kilns was destroyed by the deep stoke-pit belonging to kiln I, while the foundation of the tile-kilns themselves were dug into the topmost layers of the filled-in stoke-pit in front of kiln II, indicating that the period of tile-kiln-industry lay between the oldest and the latest brick-kiln.

The rectangular kiln looked like a small edition of the ordinary brick-kiln and has undoubtedly been used for the baking of green unglazed tiles, which can be stacked and fired much in the same way as bricks. The oval domed kiln had much in common with the medieval pottery-kiln and had clearly been used for glazing. A row of bricks across the floor could be remains of a non-permanent wall, used to partition off the lower third of the kiln as a firing area. The floor above was covered with innumerable patches of glaze and the glazed tiles had obviously been stacked here, probably protected from the flames by the flimsy brick wall, referred to above which would have been constructed with a number of holes to permit the heat to enter the upper part of the kiln.

The wasters in and around kiln III and IV showed that relief tiles with five different designs have been fired in the kilns (Fig. 49-53). Thanks to the medieval

method of tile decoration, where a wooden stamp is pressed into the soft clay surface, it is possible to determine, whether the same wooden stamp has been used on tiles found in different places. Tiles made with the stamps used on the Bistrupwasters are found in a number of churches around Roskilde and in the north-western part of Zealand, but it is doubtful whether all these tiles were manufactured at Bistrup. The preliminary results of an analysis of the clay from Bistrup compared with the clay used in tiles from other places point to an alternative source of the production. The tile-kilns at Bistrup is the first example in this country of kilns specially constructed for the production of floortiles. Previously wasters of glazed and ornamented tiles have in a few instances been found in connection with brickkilns.

The five excavated kilns were in use during different periods over three hundred years. The production in the latest kiln I was probably stopped towards the middle of the 16th century. The decorated floor-tiles from the tile-kilns can be dated from archaeological finds of similar tiles to the first half of the 14th century, and the oldest brick-kiln may be placed in the 13th century. But this kiln is by no means the oldest on the site. A number of moulded bricks for vaults and pillars from the first half of the 13th century was found in the layers of refuse and had been used as building-material in the other kilns.

Only a small part of the hill was excavated in 1975-76, but the number of kilns and the amount of material found within this modest area show a very intense activity and allow the conclusion to be drawn that the little hill at Bistrup was the centre in a large and extremely varied brick and tile industry during the greater part of the Middle Ages.