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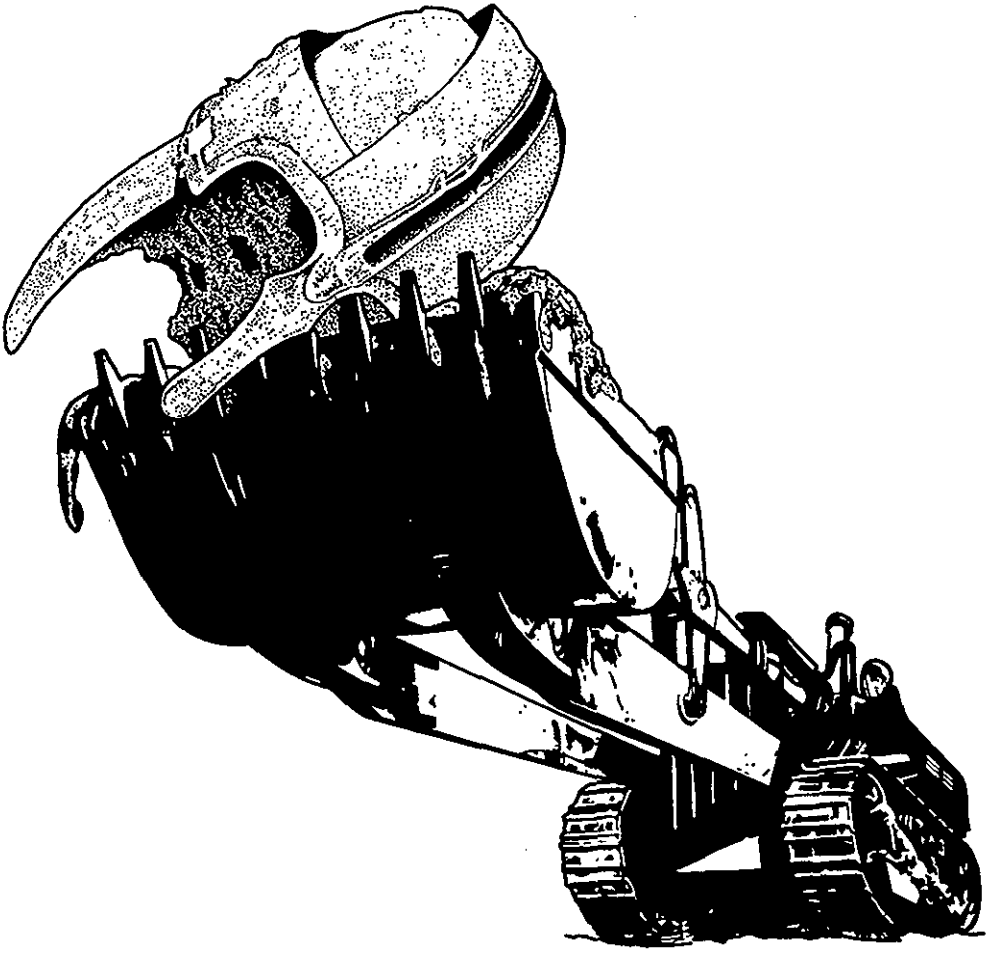

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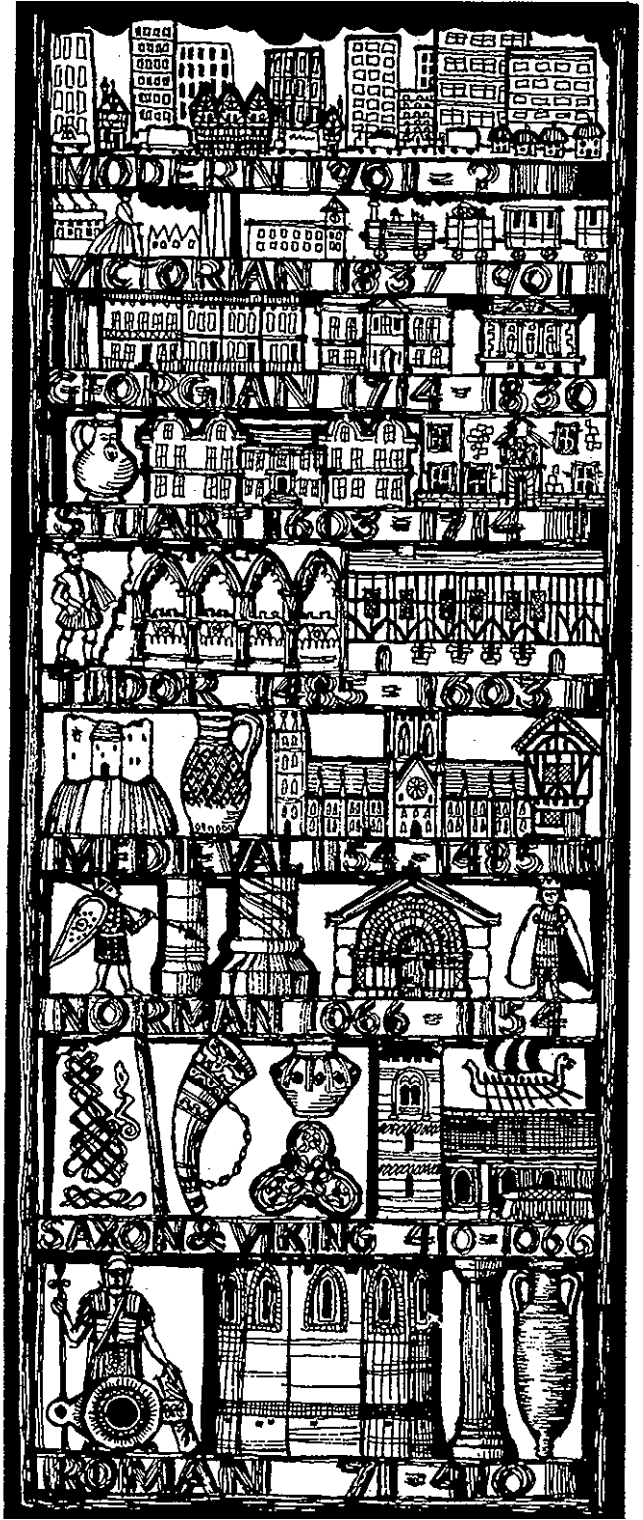
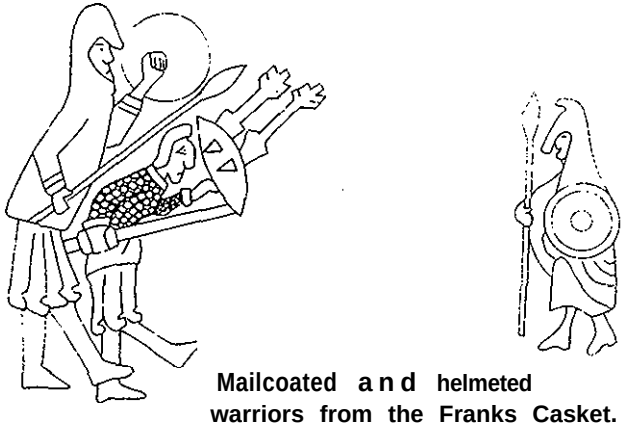

MODERN 1901 - ?
VICTORIAN 1837 - 1901
GEORGIAN 1714 - 1830
STUART 1603 - 1714
TUDOR 1485 - 1603
MEDIEVAL 1154 - 1485
NORMAN 1066 - 1154
SAXON & VIKING 410 - 1066
ROMAN ? - 410



Mailcoated and helmeted warriors from the Franks Casket.

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The Coppergate helmet partially cleaned.

SITES REVIEW

Coppergate Piccadilly

watching brief

The last issue of INTERIM included a report on the first six months of this project. In that report it was emphasised that although structural evidence had been observed and recorded from all periods from Roman to the present day, there had been a very poor rate of recovery of interesting artefacts. This was partly because the bulk of the material removed up to that date had been medieval and later, and also because there was much contamination with post-medieval material and-general building-site debris.

'This situation was altered dramatically on the 12th May 1982 by the finding of a single object (Small Find No. 155), the Coppergate Anglo-Saxon Helmet. The circumstances surrounding this discovery and the artefact itself are discussed in greater detail elsewhere in this issue.

Although Small Find No. 155 is undoubtedly the single most important find of the watching brief, ground clearance and construction have continued apace and much information of considerable importance has been collected.

In the last four months spoil removal has continued in the three following areas and been completed in a fourth:-

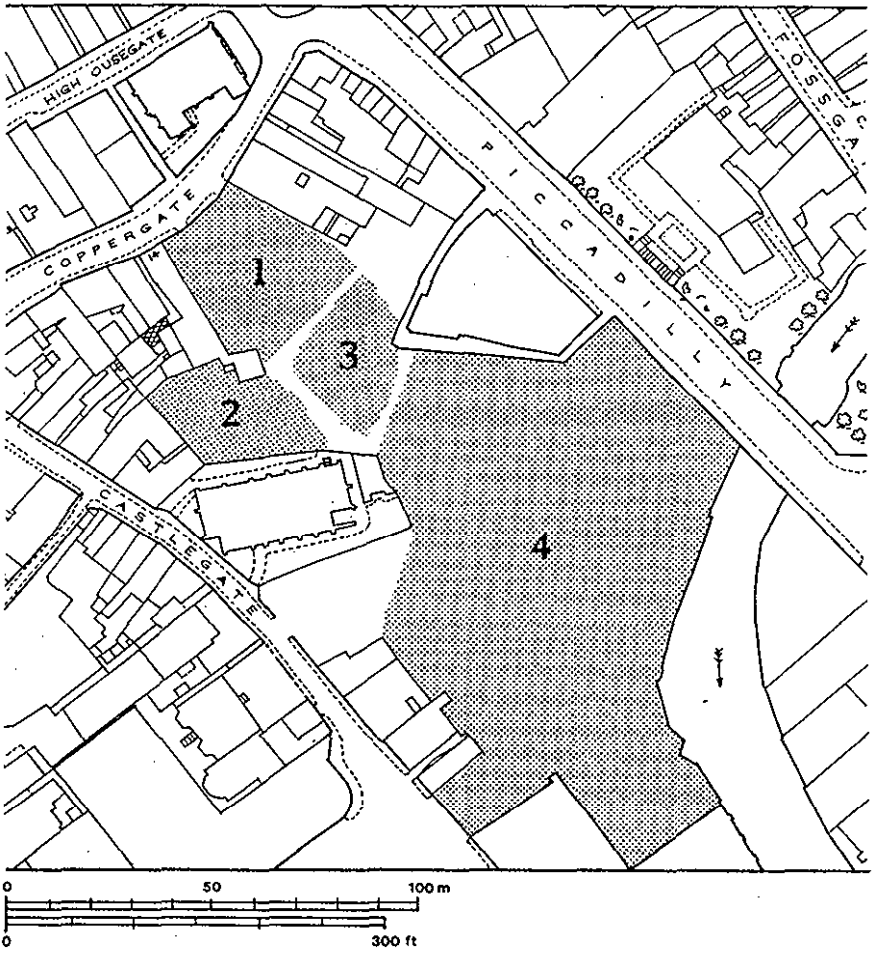
(1) The area fronting onto Coppergate where the "Viking Dig" was situated.

(2) The area to the rear of Coppergate extending as far as the north of, St Mary's Church, Castlegate.

(3) An area linking (1) and (2), to the rear of the ABC Cinema.

(4) The huge area adjacent to the River Foss, formerly the site of the Piccadilly Car Park.

In the area fronting onto Coppergate recent work has consisted of the removal of all deposits down to the natural clay at the edge of the development area, immediately adjacent to the foundations of 14 Coppergate. This material was *not* removed by the contractors until steel struts had been inserted to support the perimeter sheet piling. No evidence was found for any,



Coppergate/Piccadilly: location of four main areas of site.

further Viking Age timber buildings fronting onto Coppergate, but two groups of wicker fence lines from within the Viking levels suggest that property divisions were present here as they were in the main excavation.. No other structural evidence has so far been found in this area, but within a pit cutting the natural clay the fragmentary remains of what may be a plough were found. This consisted of the left handle, 1.70m long which utilised the natural curve of the wood, part of the main frame, and the plough share itself. The shoe was missing as was most of the right handle. This had been sliced off when the perimeter sheets were inserted. No other finds Were made within the pit and so it is difficult to assign a date to the plough.

In the area to the rear of 14 Coppergate and extending as far as the north wall of St Mary's Church, Castlegate, 4 to 5m of deposits have been removed in two successive stages since the last report in INTERIM. This material consisted of the homogenous dark grey clay loam found throughout the site. Very little of interest was recorded from within this deposit, except for several inhumations. These were all found lying on an east-west orientation with their heads to the west, and did not appear to have been buried in coffins. They presumably belong to thecemetery of St Mary's Church. All the graves were found within 8m of the north wall of the church and were in association with finds of medieval date. Nd evidence was found for any churchyard boundary. All human remains were removed by hand by members of the York Archaeological Trust before mechanical excavation took place.

The third area of ground clearance of recent months was behind the ABC Cinema, between the two areas discussed above. The ubiquitous dark grey clay loam was again encountered but in this case large quantities of animal bone were present, and also several pits of medieval and earlier date were observed, cutting through the clay loam.

A large part of this area had been disturbed when the massive brick foundations for an industrial chimney were built in the 19th century. This had destroyed all archaeological deposits right down to the natural clay. These foundations were removed and cutting into the natural soil, partly beneath them and partly beneath the dark grey clay loam, a number of pits were discovered. These pits are not linked, varying in date from the Roman to the medieval period. Within one of those pits Small Find No. 155, the Coppergate Anglo-Saxon Helmet, was found.

The fourth and final area worked on in recent months was the huge area adjacent to the River Foss formerly the site of the Piccadilly Car Park. All ground clearance here has now been completed and construction of the foundations of the new development is in progress. Now that excavation has stopped some initial observations can be made.

Firstly, the natural clay was not observed at all over the car park area and consequently must be dipping down towards the River Foss from Coppergate and Castlegate. The depth of excavation necessary for the new development was simply not sufficient to enounter natural at all. This is unfortunate as it had been hoped that the contour of the natural here might have provided information regarding the course of the River Foss in successive periods.

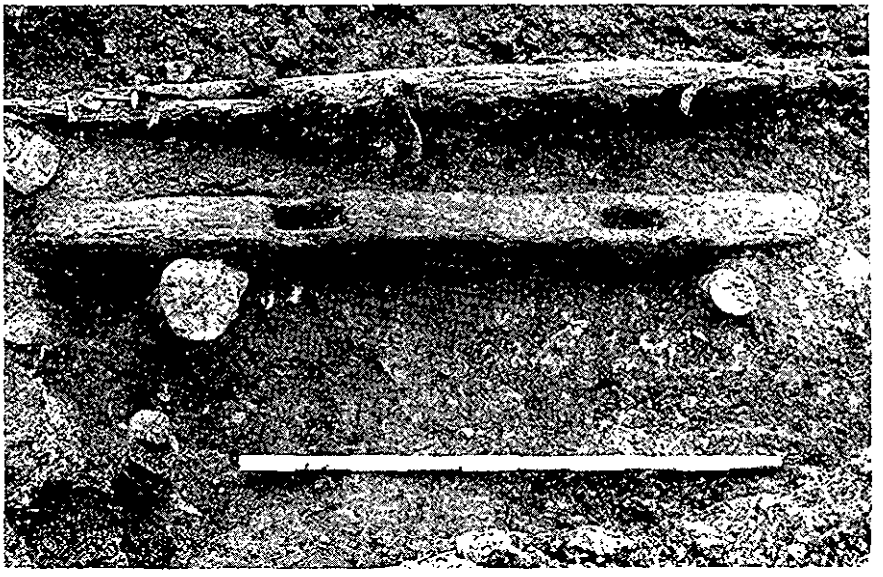
As the natural slopes down towards the River Foss, and because the modern ground surface prior to redevelopment was fairly flat, it follows that the greatest depth of archaeological deposits is nearest to the river. This is reflected in the material gathered from this area which was largely of medieval date. Deposits from earlier periods are presumably at a depth greater than that achieved in the present development, or are perhaps not present at all.

Verylittle structural evidence was found in this huge area and the nature of the dark grey homogenous deposit revealed and the finds from within it would indicate the gradual accumulation of material dumped on the river bank throughout the medieval period. A number of rough timber features were recorded. These consisted of crude timber revetments including one which was constructed in a trestle arrangement and one which was made of re-used boat timbers. The individual strakes (horizontal timbers making up a boat's side) with their adhering caulking (water-proofing) could be clearly identified. These structures have been interpreted as attempts to revet the river bank, albeit in a very rough and ready way, in what must have been a very wet and boggy area immediately adjacent to the River Foss and the Kings Fishpond.

The one major feature of interest which emerged in this area was a large cut of medieval date through the dark grey clay loam. The topmost fills of this cut consisted of dumps of material high in organic content, and the bottom-, most fills consisted of water-sorted silts. The size of the particles would indicate that the silts had been laid down in fairly stagnant water, rather than by a fast flowing river or stream.'

The problems of interpreting this feature are acute. Firstly not all of it was present within the development area, and an unknown proportion of it lies outside the sheet piling. Secondly, it was only observed in section. Furthermore,. the depth and instability of the surrounding deposits made even a minimal amount of excavation impossible. As a result of these problems neither the width nor the orientation of the cut is known.

However, on the basis of its date, location and the particle size of the bottom fills it has tentatively been interpreted as a ditch associated with the defences of York Castle. It is possible that it is a continuation of the ditch that was excavated in the Castle Garage excavation of 1981, suggesting that it ran directly to the River Foss, rather than curving round to join the ditch around the Motte on which Cliffords Tower now stands. (INTERIM, vol. 8, no. 2, p.11). It must be emphasised that this is only an initial interpretation.



Coppergate/Piccadilly: revetment of re-used boat timbers.

The policy of manually sorting the spoil from all excavation areas, at the dumping site near York, is still being continued, although this is now being augmented, where safety factors allow, by the retrieval of artefacts actually *on* **site. The** *degree* **of** *contamination* **with post-medieval and site debris is obviously lower if the material is looked at before loading onto lorries.**

The bulk of the ground clearance has now been completed and so the chances of further finds as marvellous as the helmet are diminishing daily. Let's hope, though_, that further surprises are in store for us. The next issue of INTERIM will contain news of the last weeks of the watching brief.

In conclusion I would again like to thank all the Wimpey personnel for their interest and assistance, end indeed for altering their work schedule on several occasions to give us sufficient time to undertake our task.

Nick Pearson

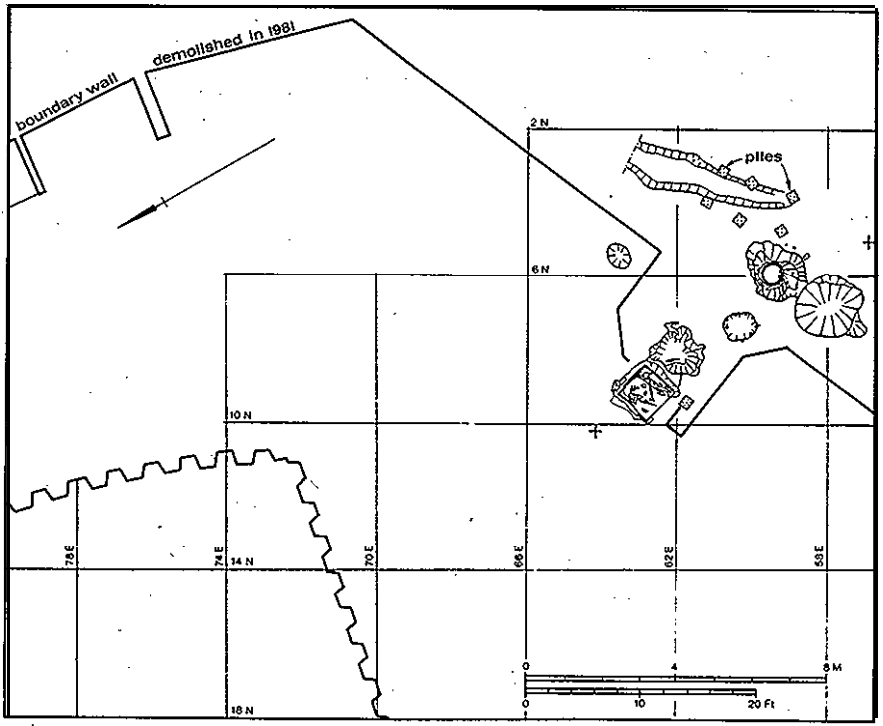
a close shave

On the 12th May 1982, machine operator Andy Shaw was engaged in the levelling of an area of natural clay on the Coppergate/Piccadilly Car Park Development, using a large, tracked mechanical excavator. At approximately 2.40pm he was working in a spot midway between the rear of No. 14 Coppergate and the back of the ABC Cinema when the bucket of his machine revealed a solid round object.. The foreman of that part of the site, Chris Wade, who was supervising the machine, thinking that the object was a stone, took a closer look to see how large it was. He immediately spotted a strip of brass decorated with an inscription and realised that it was in fact a helmet.

The find was immediately brought to the attention of members of staff of the York Archaeological Trust, who are currently engaged in a watching brief on the site.

The area in the vicinity of the helmet was then cleared of loose spoil and the helmet was found to be lying in a rectangular pit measuring 1.2m x 1.38m, cutting into the surrounding natural clay. The edges of the pit were lined with thin planks bevelled at the ends to form a neat join. The individual planks were not jointed together in any way, nor was the bottom of the pit planklined. Throughout the remainder of that day and the next the pit was carefully excavated; the helmet and spearhead (see below) were lifted from the ground at about 8.30pm on the day of discovery, under the watchful eye of Trust Conservator, Jim Spriggs. It proved to be a very shallow cut into the natural clay, a matter of only IO-15cms in depth. The remainder of the pit above the level of natural had been destroyed by the building of brick foundations in the 19th century (see below) and so we have no information as to its true depth. It contained one fill, a deposit of dark grey slightly peaty clay loam.

The Coppergate helmet as discovered. The area of damage by the bulldozer reveals the chain mail and second cheek piece inside.

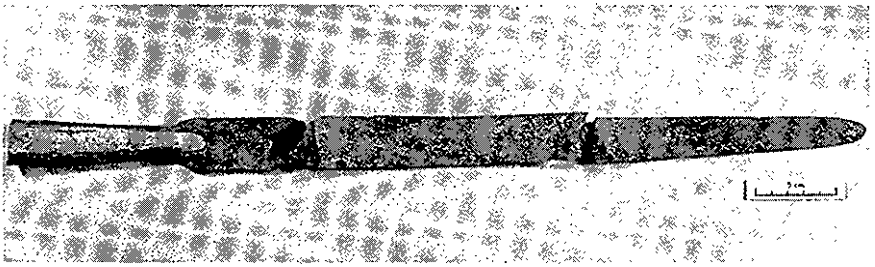


Coppergate/Piccadilly: location of helmet and surrounding pits in relation to edge of main Coppergate excavation.

The position of every single item found within the pit was plotted and photographed in detail. Apart from the helmet, there were only three other finds of note. The first was a thin blade 45cms in length in a very corroded and fragmentary condition. The second was a wooden disc 1.5cms thick and 14cms in diameter which had 5 holes, each Icm in diameter, drilled through it in a cruciform pattern. The third was a small fragment of crucible. Other finds from within the pit included four small pieces of slag, three very corroded iron fragments, a piece of antler beam, a small fragment of clear glass, and a smooth rounded stone. Also present was a small amount of fragmented animal bone, several thin twigs and fragments of wooden planking. It is possible that the planks were part of the pit lining which had become dislodged and fallen into the fill.

All the soil removed from within the pit and in its immediate locality was kept so that it may be washed down in the hope that any environmental and biological remains found will give us some insight into the nature and function of the pit. It is also possible that small objects overlooked during the course of excavation may be found within this material.

The Coppergate helmet lying in situ within the rectangular plank-lined feature.



The 7th-century spearhead discovered close to the Coppergate. helmet.

It would be unwise at this point *to* speculate upon the overall significance of this pit but it is worth mentioning that the positioning of the helmet and the blade would clearly indicate that they had not been deliberately or carefully laid within the pit. The blade was pressed against the timber lining along the eastern side of the pit in such a way that it had fractured in antiquity. The helmet itself was found lying face down and tilted slightly to one side, pressed into the natural clay at the bottom of the pit.

It was evident that other areas of disturbance were present, cutting the natural clay adjacent to the pit, and so over the course of the next week all the available area was investigated. This totalled almost four hundred square metres. For this we must be very grateful to the contractors, Wimpey Property Holdings Ltd who postponed further clearance until the work was completed.

The result of this work was that five further pits and a long narrow trench were found cutting into the natural, all within a distance of six metres of the pit containing the helmet. These pits are a good cross section of the pits found on the Coppergate dig. One was barrel lined, a second was lined with medium sized stakes and another was wicker lined. The other two pits and the trench had no lining.

It is not possible to directly link any of these pits with the pit containing the helmet. The helmet pit is the only one with a planked lining. It is also the only rectangular example, (if one excludes the trench, which is obviously in a different category); all the rest are circular in shape. The finds also indicate the lack of any connection, indicating in fact that they belong to different periods. The trench and the pit immediately adjacent to the helmet pit contained large quantities of Roman pottery and therefore probably belong to that period. The other pits either had no dateable finds or just a couple of sherds of Roman pottery. They may therefore be Roman or later. The helmet and the spearhead are the only objects that can definitely be assigned to the Anglo-Saxon period.

It is hoped however that dendrochronological and carbon 14 dating from the wooden linings and fills of the pits will eventually provide further dating information. Environmental and biological samples were also collected from the fills of each of the pits. These materials are now being analysed by the Environmental Archaeology Unit, and further interpretation must await the completion of this work.

Before concluding this report it is worthwhile outlining the circumstances surrounding the finding of the helmet as they show vividly how fortunate we are that such an important find has been preserved for us.

Firstly, the pit containing the helmet lay immediately beneath the massive brick foundations of the Cravens factory chimney. When this was built in the 19th century all deposits above natural were removed, destroying the upper levels of the pit containing the helmet and leaving only the bottom few centimetres undisturbed.

In February of this year when work was begun on this part of the redevelopment area the brick chimney foundations were broken up by a large hydraulic chisel mounted on a mechanical excavator and then removed from site. If the chisel had bitten too deeply into the natural clay et this point the helmet could easily have been destroyed in situ or taken from site with the brick rubble from the foundations. If it had then been found at the dumping site near York, it would probably have been badly damaged having suffered such treatment.

The next stage in the redevelopment of this area involved the infilling of the hole where the foundations had been removed, so that pile driving machinery could be brought in to punch in the piles necessary to support the foundations of the new development. The piles used were made of reinforced concrete and were quite simply hammered into the ground using a large weight. The nearest pile to the helmet was only 1 ½ metres away!

Once pile driving was completed, ground clearance began to take place in stages to take the surface down to the required level for the new foundations. Excavation was carried out by a large machine using a wide toothed bucket. The technique used was to bite deeply into the underlying deposits and load the resulting spoil directly onto awaiting-lorries. The chances of seeing the helmet in situ,. if it had been unearthed in these conditions, would have been minimal. However at this point the most remarkable event in the discovery of the helmet took place. The design of the Jorvik Viking Centre which will occupy this part of the redevelopment site (INTERIM vol. 7, no. 4, pp.2-6) was altered in such a way that plans for a sub-basement were scrapped. The find spot of the helmet is well within the area that would have formed that sub-basement. If the design had not been changed, the large toothed buckets would have continued to have been used to a level almost three metres lower than that in which the helmet was later found. In that case it would probably not have been seen until it reached the dumping site by which time,, as stated above, it would most certainly have been severely damaged.

Whilst new designs were awaited for the former sub-basement area Chris Wade instructed his driver Andy Shaw to take the whole area down to the same approximate level. He did this using a flat scraper bucket removing the natural clay only a few centimetres at a time. This is just about the only way in which large quantities of material can be moved by mechanical means and yet still leave the surface smooth enough for objects unearthed to be seen readily. It was whilst this operation was taking place that the helmet was found.

The final piece of good fortune was that the level the machine was working to was approximately 6.46 metres OD. The height of the top of the helmet was exactly 6.37 metres OD!

Nick Pearson

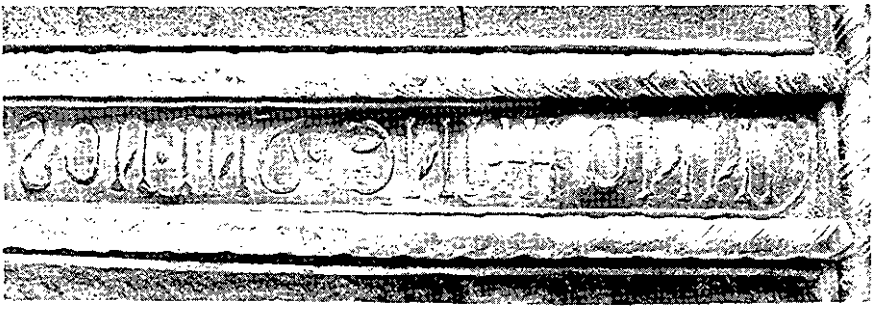
Description & Art-Historical Context

The helmet consists of four main elements: the cap, two hinged cheek pieces, and a curtain of mail protecting the nape of the neck. The body of the helmet is of iron, with decorative fittings of brass.

The cap is composed of a broad band encircling the head, with a second, narrower, band rivetted on and running from the back to the front of the head. At each side this is linked to the circular brow-band by short bands running down towards the ears, and rivetted on. The four spaces left by this framework are filled by triangular plates with their corners cut off, again rivetted on; a construction which is particularly apparent where the bulldozer has torn one of these plates away. At the front two half circles have been cut out of the brow band for the eyes. Between them there is a long nasal, expanding from the junction of the aye holes to form two points, one on each of the long edges, before tapering again. Finally, towards its rounded end the nasal expands once more. The nasal has a plain edge moulding and is decorated with a pair of symmetrical interlacing animals with hatched and contoured ribbon-like bodies, and spiral hips. These animals apparently develop at their lower ends into interlace of Adcock's basic pattern A although precise details of this ornament will only be apparent when cleaning is completed.

Over the eye holes there are separately made copper-alloy eyebrows decorated with oblique transverse hatching, and terminating at their outer ends in animal heads viewed in profile. Again, precise details of these heads will only be visible after the completion of cleaning, but they have long snouts and bared teeth, with the teeth carefully delineated. The animals have high domed foreheads, and incised, coma-shaped ayes. In one case the ear is turned down and develops into a spiral on the animal's neck. On the other head the spiral on the neck seems to develop from the lower jaw. At the junction of the eyebrows there is a third animal head, this time viewed from above. This has an expanding muzzle with a rounded end. The top of the muzzle is decorated with incised chevron ornament. The animal has a high forehead, and again the incised eyes are coma-shaped. The animal's ears are placed at the very back of the head and merge into the pair of half-round, hatched, copper-alloy bindings delimiting the narrow decorative field forming a crest to the helmet.

At the back of the helmet this field has a rounded end which just overlaps the top edge of the brow-band. At this point the edge binding is flattened, and embellished with incised ornament which awaits cleaning for it to be adequately deciphered. The edge binding holds in place a single copper-alloy strip decorated in repousse (i.e. hammered into relief from the underside) with the retrograde inscription, running from front to back, IN. NOMINE.DNI.NOSTRI.IHU.SCS.SPS.D(?)EI.OMNIBUS.AMEN.OSHERE.XPI, (this may be translated very freely as 'In the name of our Lord Jesus, the Holy Spirit, God the Father, and All Saints we speak. Amen! The word OSHERE is a personal name, and the XPI the first three fetters of the work Christ in Greek). This is terminated by an interlace triquetra within a circle. Although the main outline of this inscription is clear the precise placing of the stops between the words, and the reading of the doubtful word may be clarified after cleaning. At right angles to the crest are two other narrow fields, one running down towards each ear. These have the same hatched, half-round edge-bindings as the crest, and again the fields have rounded ends just overlapping the upper edge of the circular band. In each case the edge binding is flattened at this point and decorated with incised ornament. Each of these fields is filled with a single sheet of copper-alloy with a retrograde inscription. That to the left has been heavily damaged by the bulldozer, which has torn the bindings out of position, and broken the inscription into pieces. However, reading from the brow-band towards the crest, the word OMNIBUS., the first two letters of the word AMEN, and most of the word OSHERE can be read, so this appears to be a repetition of part of the inscription of the crest. To the right the inscription is more easily readable, running from the crest to the brow-band,, IN.NOMINE. DNI.NOSTRI.IHV.SCS.SPS, again a repetition of part of the inscription on the crest. The two halves of the inscription on either side of the crest have thus been placed in a different order from that used on the crest itself. The doubtful word, or words D(?)ET, seen on the crest is missing, but appears to have come at the beginning of the inscription to the left, where there is a square modern break, not the rounded end employed at the end of the op-



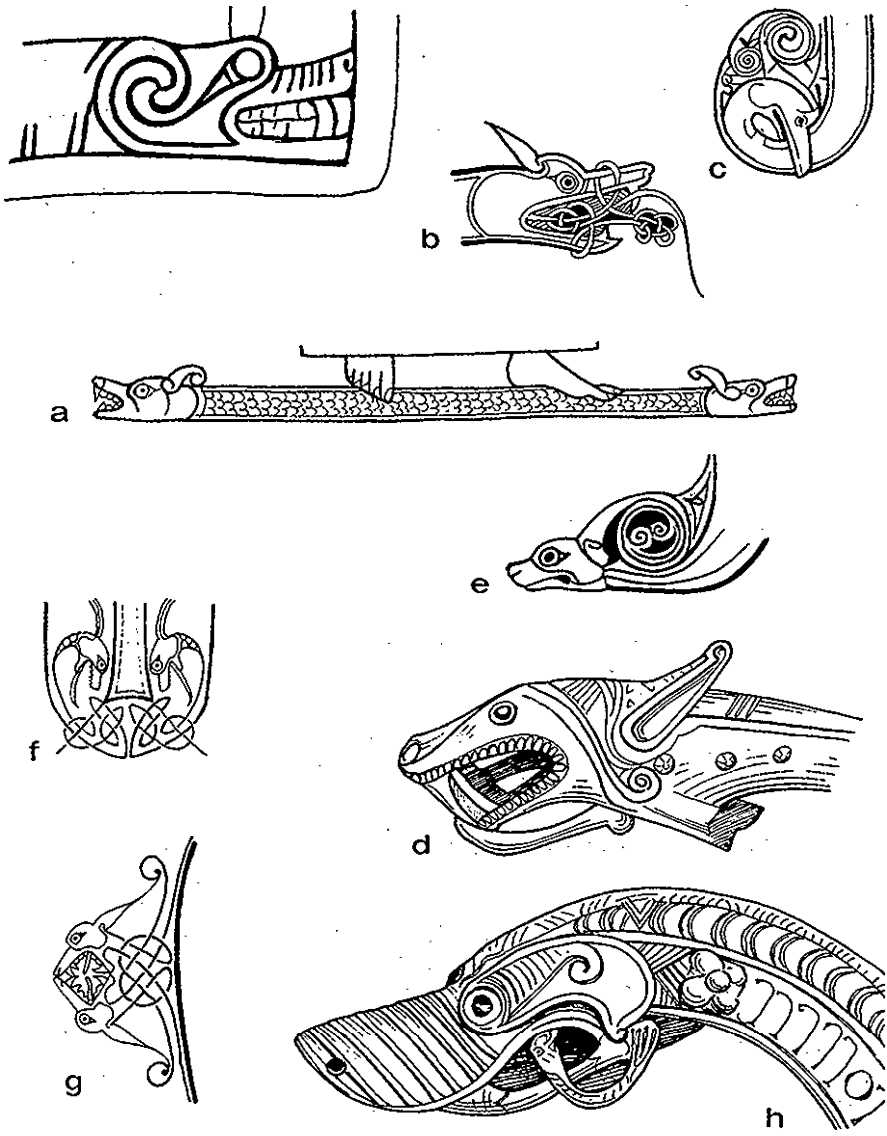
Detail of the right hand inscription on the Coppergate helmet running from the crest towards the ear.

posing inscription. This was presumably broken away by the bulldozer, but may yet be recovered, as soil from the load which the bulldozer was moving when the helmet was discovered has been carefully collected for sieving.

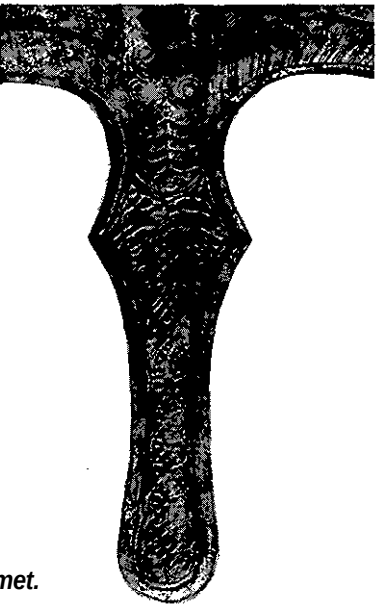
At each side of the cap *was* a separate cheek piece attached by a hinge, of which only the left-hand one is still in situ. This has a rear edge curved to form a point with the straight front edge, which is aligned with the rear edge of the eye hole. Inside, in the centre of the cheek piece there is *a* square-headed rivet which may have formed the point of attachment for a leather or textile strip tied under the chin to hold the cheek pieces firmly in place when the helmet was worn. The cheek piece has a plain copper-alloy edge binding; with, on the rear edge, three prominent copper alloy loops developing from it. Presumably these were used as fixing points for the mail which protected the nape of the neck. The deep copper-alloy binding from which this was suspened remains *in situ* along the rear edge of the cap, although much of the brow-band to the rear of the cap is missing, having been corroded away, or damaged in antiquity.

The mail itself survives bundled up inside the helmet, and is still attached to the edge binding of the cap by three rings. It lies on top of the second cheek piece, which must have been detached before the helmet was buried. The second cheek piece is vary similar to the first except that the central rivet on the inner face has a flat, circular head, not a square one.

Preliminary surface analyses of the metals, made by C. Caple of the Department of Archaeological Sciences at the University of Bradford, reveal that the iron of the cap has substantial traces of manganese and arsenic. The surface of the iron was apparently not plated. The copper-alloy sheets carrying the inscriptions are made of a very pure brass, of the order of 75 per cent copper and 25 per cent zinc, with very few impurities, as are their half round bindings.



The profile heads on the Coppergate helmet compared with al the Durham Cassiodorus, b) Cologne Dombibliotec Cod.213, cl the Lichfield Gospels, d) the -Thames Mount, e), f),g) ***the Lindisfarne Gospels and h) the St Ninian's Isle Chape. Not to scale.***



Detail of the nasal of the Coppergate helmet.

Although some indication of the date of deposition of the helmet may eventually be derived from Cl4 dating, or dendrochronological work on the timbers which lined the feature in which it was found, for the time being its dating must be derived from the internal evidence: from a consideration of the helmet's form, discussed below by Richard Hall (p 23); from the content and palaeography of the inscriptions; and from the form of the animal ornament.

The content of the inscriptions is significant as it is demonstrably Christian, and, therefore, probably unlikely to have been made before AD.627 when St Paulinus baptised King Edwin of Northumbria in York, although it could on these grounds have been made at almost any time subsequently. In fact, the form of the letters narrows the possible date range, since the forms are those characteristic of the decorative capitals, used to make the transition between the large decorated initials and the main body of the text in Northumbrian manuscripts of the very late 7th *century,* and the first part of the 8th century, as in the Lindisfarne Gospels, for example. Indeed it is possible that the inscriptions were laid out by a scribe, and then raised in repousse by a metalworker, who on turning the strips over reversed the inscriptions and failed *to* realise his errors, being illiterate. Certainly, this use of the repousse technique would support an 8th century date, since it is a technique which was widely practised in the 8th century, as on the Ormside bowl, for example.

The form of the animal heads would also fit comfortably into a very late 7th or early 8th-century Northumbrian milieu. Similar animal heads viewed in profile, with long snouts, carefully delineated teeth and slightly coma-shaped eyes appear in the Lindisfarne Gospels, probably made c.698 AD. They are used for example on the initial E on f.91r, although here they are portrayed with open jaws, and very similar heads appear on the initial M on f.90r. Animal heads of the same form occur on f.1r of the Cologne, dombibl. Cod. 213, an early 8th-century Northumbrian product and they occur also on either end of the beam supporting the figure of King David on f.172r of the Durham Cassiodorus, again a Northumbrian manuscript dating to the second quarter of the 8th century. The heads of the Durham Cassiodorus are perhaps the closest in form to those used on the Coppergate helmet, although they lack the ears developing into spirals. This is a feature seen in a rudimentary form in the Lindisfarne Gospels, as for example on the initial M on f.90r. but the closest parallel to the Coppergate animals is to be found in the Lichfield Gospels, probably a product of the second quarter of the 8th century. Such a head with a spiral ear occurs on the end of the downstroke on the P in the XPI monogram on the initial page of St Mathew's Gospel, as well as on the initial M on f.18r, for example.

The very late 7th or early 8th-century date suggested for the Coppergate helmet by these manuscript parallels for the profile heads is supported also by a consideration of late Anglo-Saxon profile heads in metal. Undoubtedly the closest parallel in metal to the heads on the ends of the eyebrows of the Coppergate helmet is th head to be found on the end of ,a mount of unknown purpose from the River Thames, and dated to the 8th century. This three-dimensional head has the same long, snout, and prominent, carefully delineated teeth as the Coppergate heads; moreover, the eyebrows curve down onto the animal's neck on each side and end in spirals, a feature paralleling the neck spirals of the Coppergate animals. The head of the Thames mount, however, differs from the Coppergate heads in that it lacks the domed forehead and coma-shaped eye. Moreover, the jaws are open, and the tongue projects. Despite these differences the comparison is significant, and more so since the top of the Thames mount is decorated with oblique hatching which is very similar, in appearance and technique to that used on the eyebrows of the Coppergate helmet. Heads very similar to that employed on the Thames mount are used on the 8th-century chape no. 15 from St Ninian's Isle treasure. Here again there is the same long snout and coma-shaped eye as used on the Coppergate helmet, although the foreheads of the animals are low, and in each case the teeth have. been reduced to a pair of canines. Here also the oblique hatching on the beasts' muzzles, is similar to that used on. the eyebrows of the Coppergate helmet. It is probably no more than coincidence that on one side of thechape is the inscription INNOMINEDS (in nomine d.s.) which echoes

Detail of the profile head on right hand eyebrow of the Coppergate helmet.

part of the inscription on the Coppergate helmet. Animal heads similar to those on the Coppergate helmet *seem* also to have been used on the early 8th-century Witham hanging bowl, now unfortunately lost. Here the heads used as terminals to the escutcheon loops have the same long snout, carefully drawn teeth, and domed forehead as the Coppergate animals. Finer details are, however, lacking on the surviving drawings.

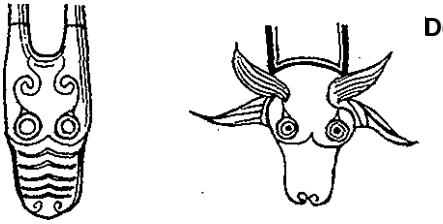
These metalwork parallels for the Coppergate heads are all of 8th-century date, but this type of head may have been used into the 9th century. This seems to be the case with the animal head label stops over the blocked arch leading into the apse at St Mary's church Deerhurst, Gloucestershire. Again these almost three-dimensional heads have the teeth carefully drawn, coma-shaped eyes, and, most importantly, the eyebrows curve down to end in spirals on each side of the neck. The snout, however, is much shorter than those of the Coppergate animals. H.M. Taylor (1978) has placed these heads in the 8th or 9th centuries, a dating based on the comparison between them and the animal-head terminals of the 9th-century strap-end series. However, in view of the obvious 8th-century parallels for this type of head, noted above, it is tempting to place the Deerhurst label stops more firmly in the 8th century. Alternatively, it is possible that they were based on an earlier model, or it may simply have been that fashion changed slowly in comparatively remote Gloucestershire.

A number of the three-dimensional metal and stone heads noted above also have parallels with the head viewed from above at the junction of the eyebrows of the Coppergate helmet. All of the animals have the same blunt end to the snout, while the animals of the St Ninian's Isle chape also employ the same coma-shaped eyes, as well as chevron decoration on the snout. It is more difficult to find manuscript parallels for this third animal head on the Coppergate helmet, but in the Cologne, Dombibl. Cod. 213, on f.1r there is an animal head viewed from above with a rounded end to rhe muzzle, and coma-like eyes, and which is used as the terminal to a narrow decorative field, *in* the *same* way as the head on the *Coppergate* helmet. A similar head is used as a terminal on the initial M on f.18v Of the Lindisfarne Gospels; although here, as a conceit, the head viewed from above is composed of conjoined heads in profile.

Little is added *to* the date in the very *late 7th, or* early *part* of the 8th *century* suggested for the Coppergate helmet on the basis of this comparative material, by a consideration of the spear head which was found close to the helmet. This spearhead has a long almost parallel-sided blade, with a slightly rounded point. The blade is narrow (c. 3.5cm wide) in comparison with its length (c. 36cm; 45cm for the spearhead as a whole), and the shoulders between the blade and socket slope gently. The split socket still has some of the wood of the shaft in it, held in place by two rivets. In Swanton's classification this specimen falls into the series E3/4. Series E3 developed rapidly in the 6th century, and became firmly established in the 7th. That it continued into the late Anglo-Saxon period is indicated by the discovery of a spearhead of this type in the 10th-century Westly Waterless, Cambs., hoard, and Swanton notes the close correspondence between this type and Petersen's type B of the Viking Age. Series E4 is essentially a variant of E3, again principally of 6th and 7th-century date.

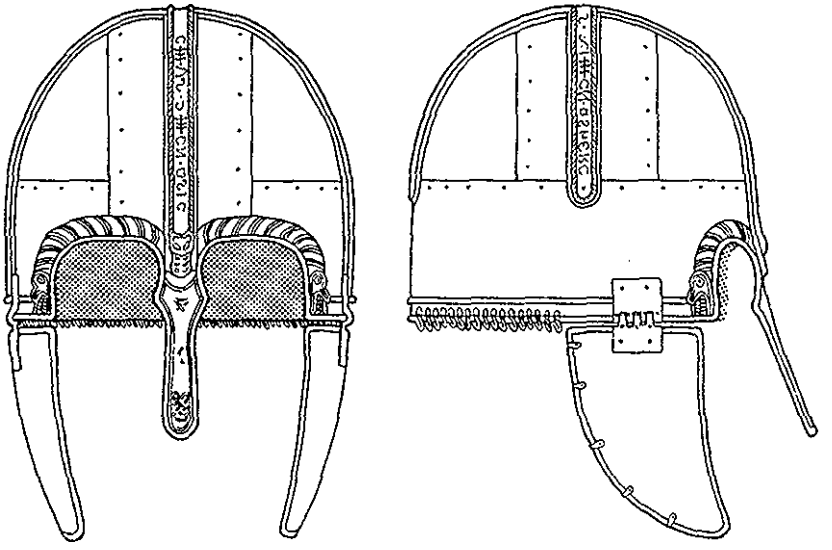
In conclusion it should be noted that these comments on the forms and dating of the Coppergate helmet remain subject to the revision which will inevitably be necessary once the cleaning of the helmet is finished, and the full programme of scientific and comparative research completed.

Dominic Tweddle



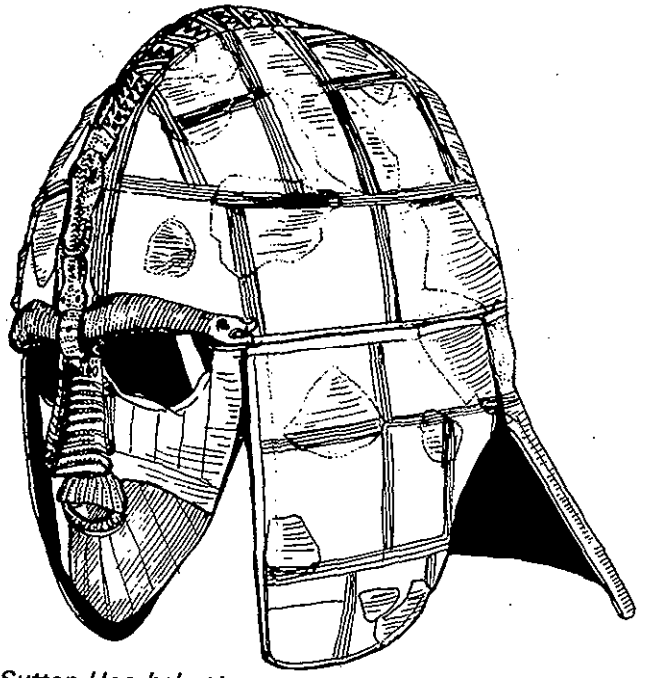
The *head viewed from above between the eyebrows on the Coppergate helmet compared with a similar head in the Cologne Dombibliotec Cod.213.*

Comparative Helmets



Coppergate helmet, drawing made before conservation.

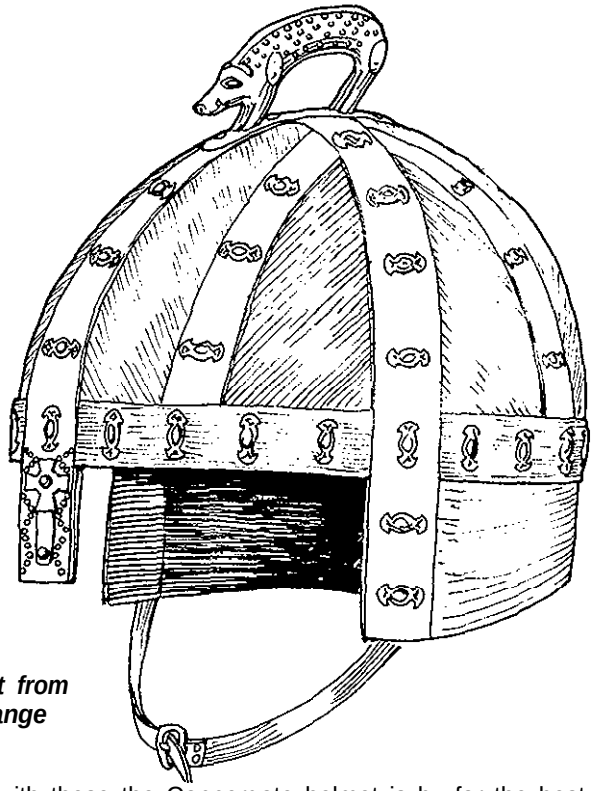
One of the archaeological excitements of the discovery of the Coppergate helmet is the rarity of contemporary helmets in Anglo-Saxon England, where there are only two comparable finds. At first sight the Coppergate helmet brings the famous Sutton Hoo ship-burial helmet inevitably to mind. The helmet was found in several hundred pieces, broken by the collapse of the burial chamber in the early 7th-century royal ship-burial at Sutton Hoo in Suffolk. Although *most* fragments were extremely small, several pieces were immediately recognisable, notably a decorated nose guard incorporating a toothbrush moustache, and two decorated eyebrows. It was first reconstructed in 1947, but taken apart and reconstructed again in 1970-l. While the form of the helmet *is* not in doubt, much of the detail of the decoration is missing, and at a guess less than 50% of the original helmet survives.



The *Sutton Hoo helmet.*

The Sutton Hoo helmet is basically a hemisphere of iron, made remarkably in one piece, which was decorated with a series of bronze plates which have embossed designs including warriors and interlace. The face was protected by a solid face guard including the nasal guard already mentioned. The eyebrows are picked out in garnets, and seem to form the wings of a dragon whose head faces upwards above them; a second dragon head facing downwards is immediately above the first, and *a* third is at the back of the helmet. Each of these is decorated with garnets. These are also hinged iron cheek-guards, and an angled iron neck-guard at the rear.

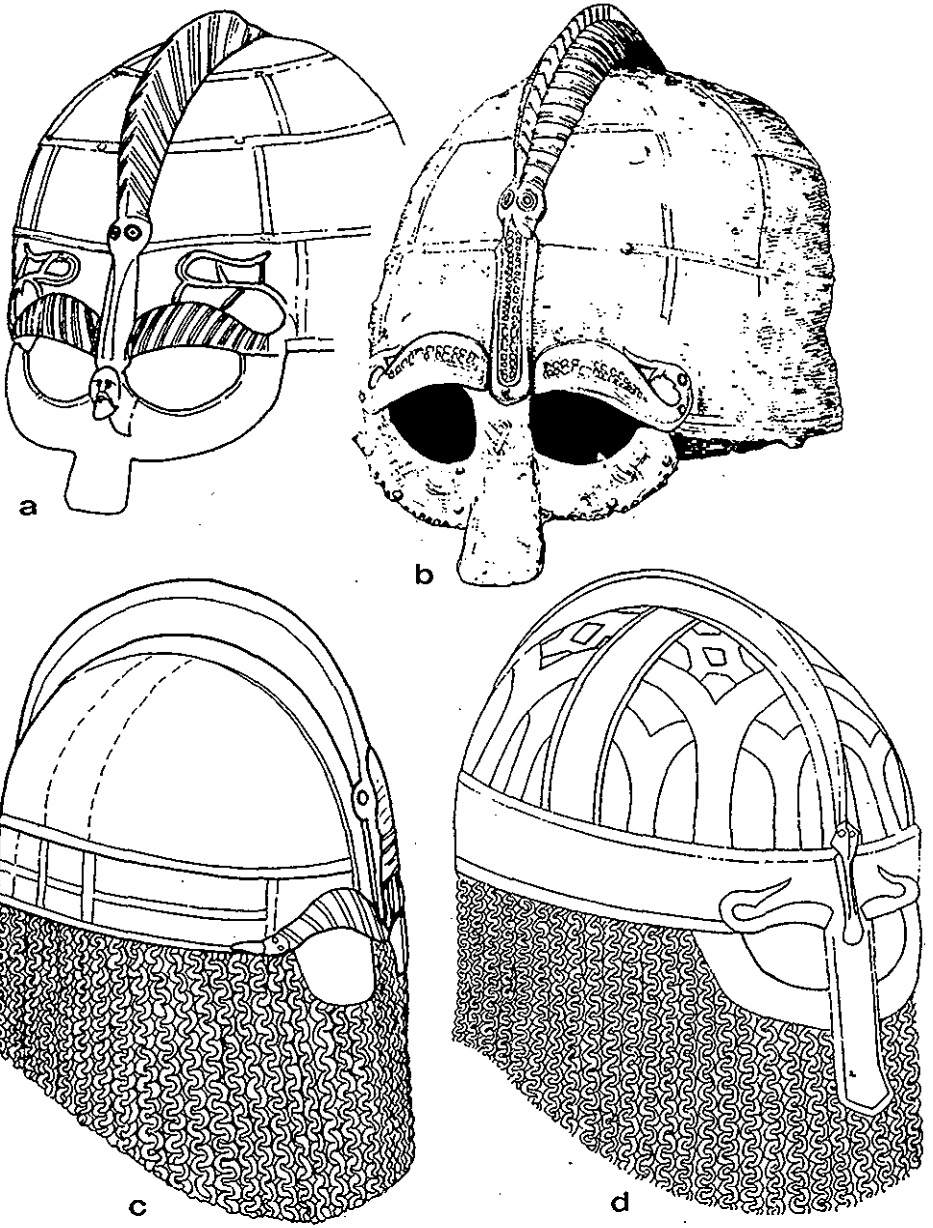
The second near-contemporary find, now in the Sheffield Museum, is a more northerly find, from a burial at Benty Grange in Derbyshire, discovered, in the last century. The remains are much more fragmentary, consisting of an iron-strip framework which originally held plates of horn which made up the main surfaces of the helmet; they are believed to have fined lower at the rear to protect the neck. There was a simple, blunt nasal guard which was decorated with a cross – an interesting comparison with the Christian inscription on the Coppergate helmet; and a boar *crest,* with gold and garnet decoration, embellished the top.



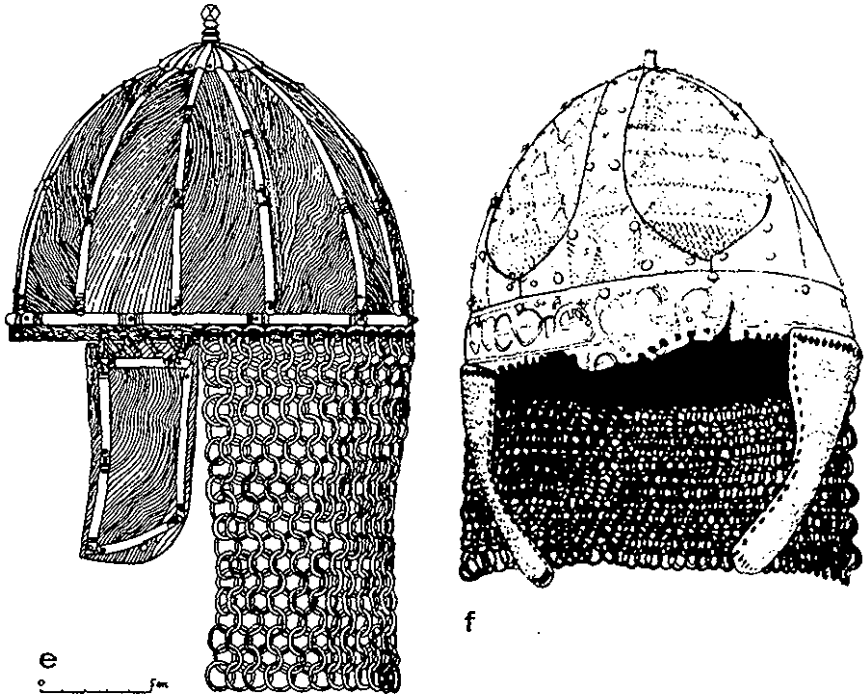
The helmet from Benty Grange

In comparison with these the Coppergate helmet is by far the best preserved, and probably the latest in date. As has been observed in its more detailed description, all the indications are that the Coppergate helmet is a local, Northumbrian product; but there is a school of thought which sees the Sutton Hoo helmet at least as being of Scandinavian, or more precisely of Swedish origin, and it is to Sweden that we can look for other approximately contemporary helmets.

The main Swedish finds come from cemeteries at Vendel and Valsgarde, sites in the Uppland area north of Stockholm. Both are aristocratic cemeteries with a series of graves extending chronologically from the Migration period (sometimes called the Vendel period after one of these finds) into the Viking Age. Helmets from both sites are broadly comparable ***to*** the Sutton Hoo and Coppergate examples, although each has its own peculiarities. Vendel grave 14, for example, is a decorated iron cap with nose guard, elaborately shaped cheek pieces which meet at the chin, and a neck guard consisting of separate iron strips. Vendel ***1*** and Valsgarde 7 are equally elaborate, each with a prominent crest running from front to back,



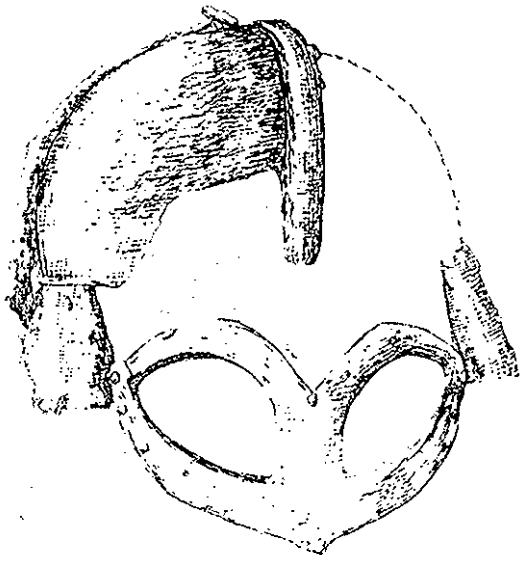
Helmets from a) vendel 12, b) Valsgarde 7, c) **Valsgarde 6,** *d) Vendel 12, e) Cologne Cathedral and f) Morken.*

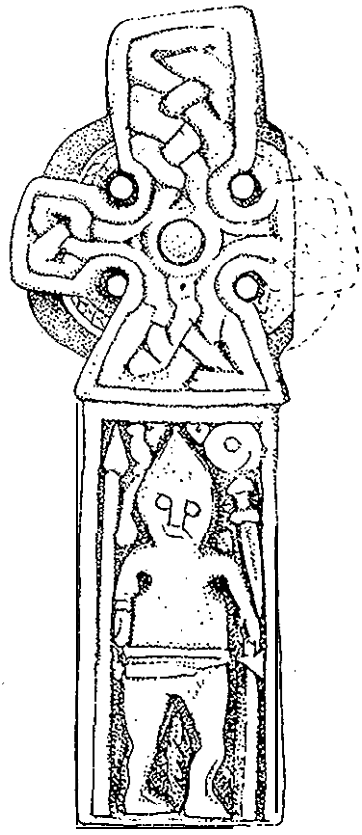


and eyeguards running from the outer ends of the helmet's 'eyebrows' down to a nasal guard. Perhaps even more remarkable are the similar Valsgarde 6 and Vendel 12, which both have a curtain of chain mail all around, protecting the lower face and neck.

From the examples it is clear that the Coppergate helmet clearly belongs to the same general family of helmets as the Swedish examples and that from Sutton Hoo, but there is no reason to think that the Coppergate helmet is Swedish, and every reason to think of it as a local product. All ultimately base their design on late Roman helmets, as do some helmets from nearer in Western Europe which, however, derive from a different Roman type and are distinguished by having a conical rather than a hemispherical cap. These are generally known by the German term ***spangenhelm,*** and two well known German examples illustrate the type – the miniature helmet from a grave below Cologne cathedral, made of gilt bronze strips and horn plates, with cheek pieces and a chain mail neckguard, and another from a warrior ***grave*** at Morken, 25 miles north-west of Cologne, again with cheek pieces and mail neck guard.

The helmet from Gjermundbu and the warrior cross from Middleton.





What effect did these slightly earlier helmets have on Viking Age or late Saxon helmets? The most complete Viking Age helmet to survive comes from a grave at Gjermundbu in Norway – it is a series of iron plates riveted together like that from Coppergate, but with eye-guards of all-round type like some of the Vendel-Valsgarde examples. This example seems to represent the final popularity of the hemispherical cap type; thereafter throughout large areas of north-western Europe it was a simple conical helmet, often with nasal guard, which became popular. This is the type represented on the warrior crosses from Middleton in North Yorkshire, and both Anglo-Saxons and Normans are depicted wearing it in the Bayeaux Tapestry, It is also portrayed on the miniature carved head of antler from Sigtuna in Sweden. For a surviving example of the type it is necessary to go either to Prague, to see the helmet of St Wenceslas, or to Vienna, where another Czech find is now displayed. There are no English finds to report. Perhaps the last few weeks work at Coppergate might.....

Richard Hall

Conservation of the Helmet

Like so many of the finds from the Coppergate excavation, the helmet was discovered buried in waterlogged levels, where the lack of oxygen had prevented the metal of the helmet from corroding to any great extent. We know that the thin grey/black layer of corrosion which had formed on the surface of the iron is composed of sulphides and phosphate. Formed in the absence of oxygen, these corrosion products appear to provide the metal surface with a certain degree of protection until the object is exposed to the atmosphere. In the presence of oxygen and moisture some of the corrosion products become unstable, and a rapid corrosion cycle can commence, attacking the remaining metal with the formation of the familiar orange rust.

The normal way of preventing this destructive process from starting is to dry the object out artificially using dessiccating agents so that the reaction is starved of water. In the case of the helmet, we were concerned about removing the moisture, since we were very much hoping to find the remains of any organic material, such as leather or a fabric, with which the helmet may originally have been lined. Where organic remains do survive, they are normally in a very weak state, and held together only by the water which they contain. Drying can often cause their total disintegration. Also, if the clay inside the helmet was allowed to dry, it would have become very hard and difficult to remove. Having decided to store the helmet wet, at least until the contents could be investigated properly, the only option available to avoid corrosion damage was to attempt to keep the oxygen in the air away from the metal. So it was that not long after its discovery, the helmet was lying on a padded support inside an airtight plastic box with a transparent lid, connected up to a cylinder of nitrogen gas – an efficient method of keeping oxygen at bay. This all had to be organised very quickly, and we are indebted to the York University Biology Department technicians who provided the equipment at such short notice. Since discovery, the helmet has only been removed from its inert atmosphere on three occasions, and then only briefly, for photography and recording. During these brief outings, some of the corrosion on the metal surface has turned a bright orange colour, a startling indication of how necessary our precautions were.

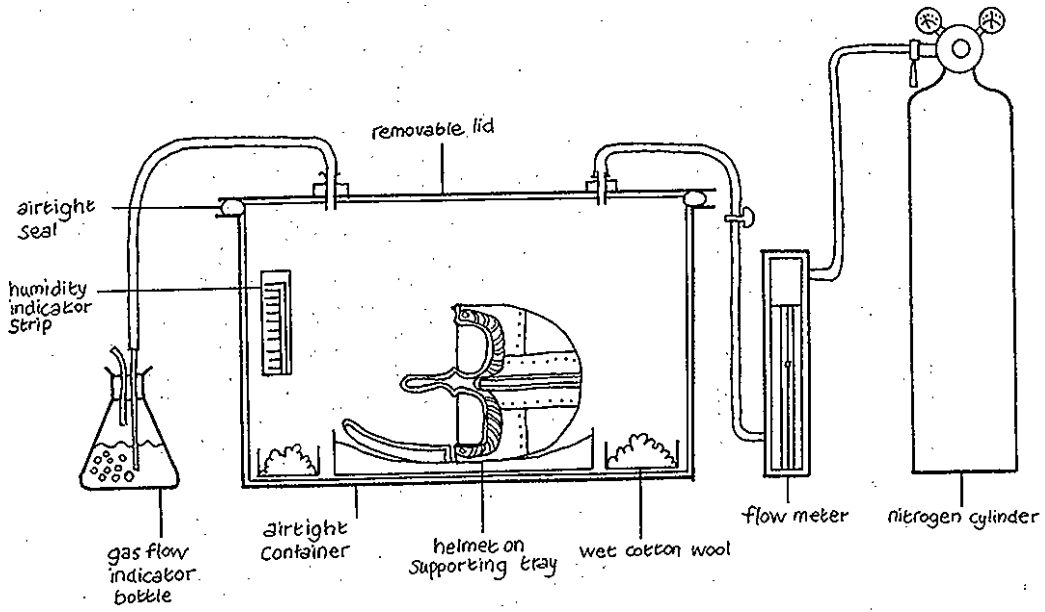
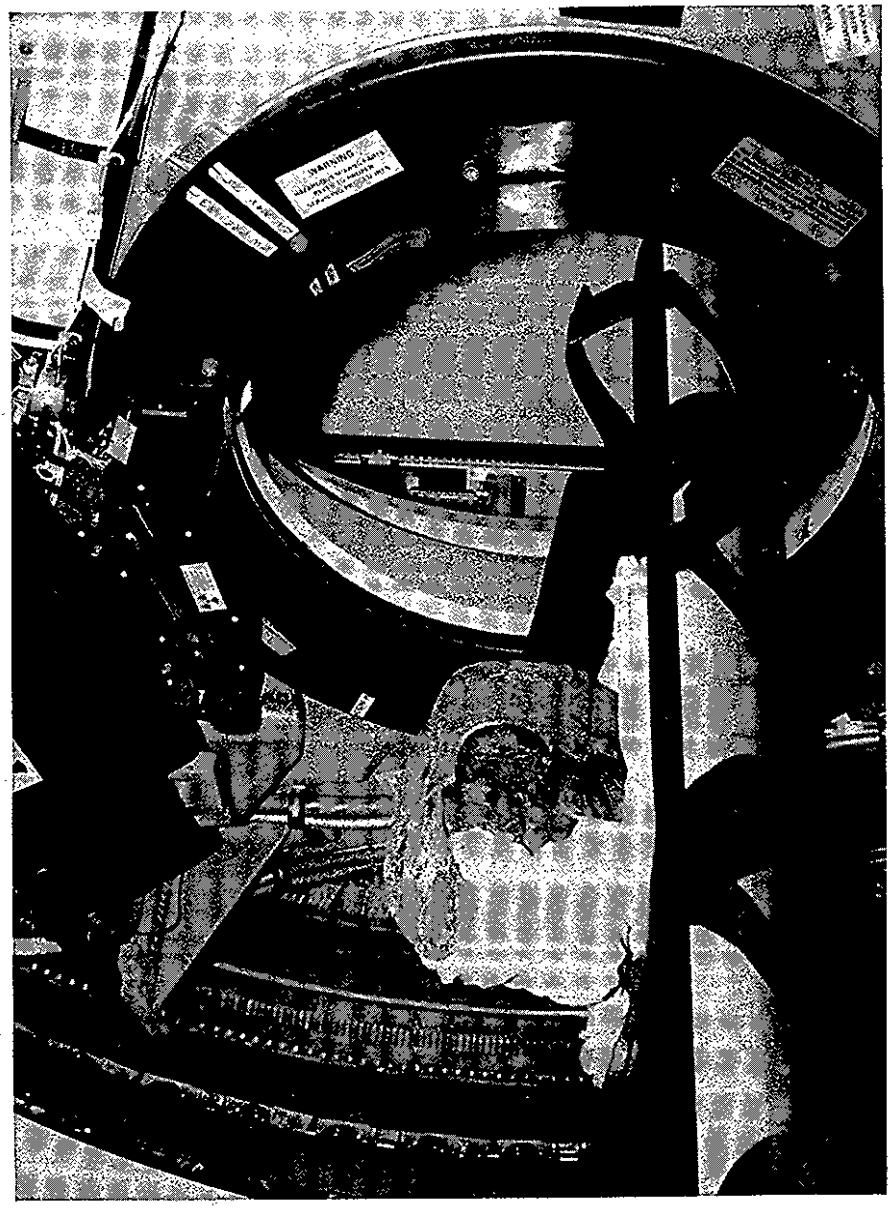


Diagram showing method of temporary storage of unconserved helmet under Nitrogen gas.

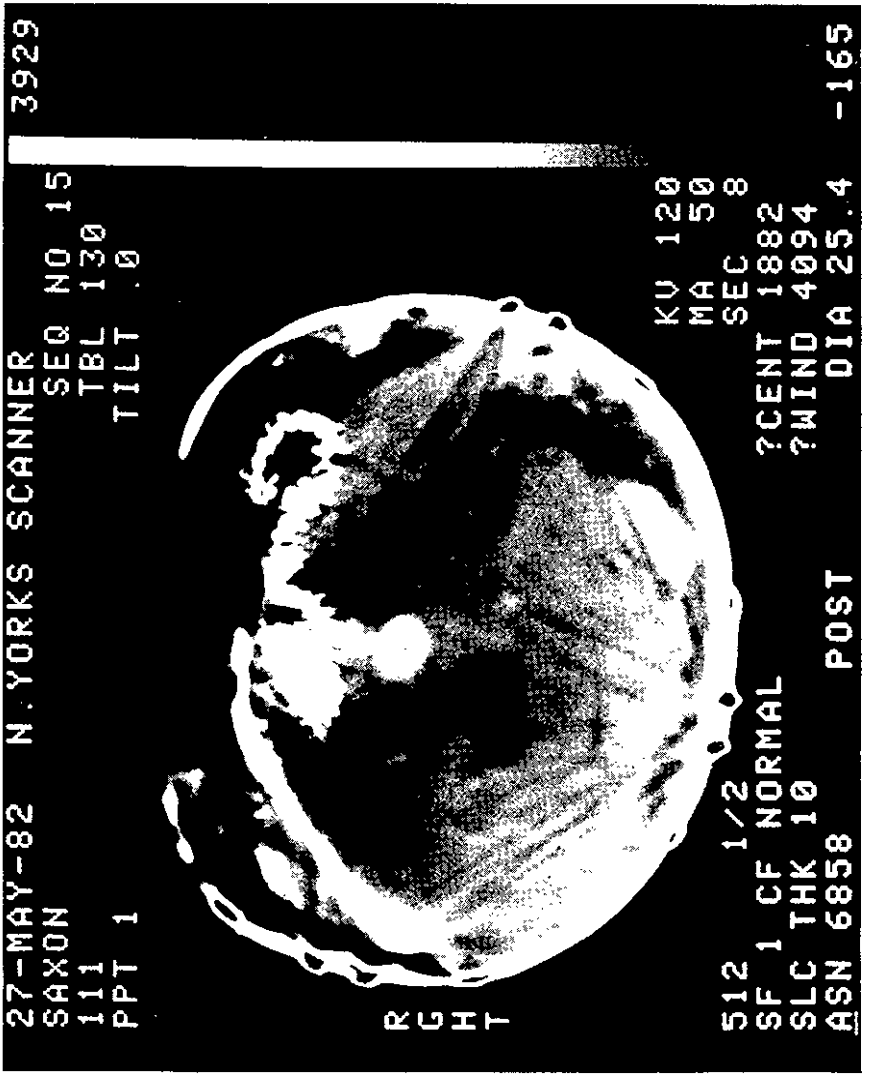
The conversion work so far had been of a passive nature, to provide a safe and stable environment in which to store the helmet whilst a programme of work was formulated. Experts and specialists in the fields of art history, technology and conservation from the major national museums and institutions were invited to come and see the find and to advise us on the considerable problems which the conservation and scientific research of such a complicated object can present. We felt that it did credit to our conservation team that the specialists appeared to have complete faith in our abilities to conserve the helmet in the Archaeological Trust's own conservation labs in York.

The first essential was to use X-radiography to see what (if anything) was inside the helmet along with all the mud and clay. We hoped that somewhere inside would be the missing cheek-piece, and possibly even some chain mail (correctly just called mail) which we suspected had originally formed a neck-guard. Not only did we want to know ***what*** exactly lay inside, but also where each object was positioned. This was to be of critical importance in planning the excavation of the interior of its delicate contents.

To advise and supervise on the X-ray process we were fortunate to get the help of Dr Johnson, Senior Radiographer at York District Hospital. He met us one day at the hospital's emergency entrance, our precious find was transferred from car to trolley, and wheeled into one of the X-ray rooms. The helmet, protected and padded in its airtight container was placed on the couch, and with the care and efficiency given to any patient, was systematically radiographed. The medical staff had chosen tomography as the radiographic technique most likely to yield us the information we wanted. The rocking motion of the X-ray tube over the 'patient', coupled with a corresponding movement in the X-ray plate underneath the couch, gives a layered image at different depths through the object. Thus, as each X-ray plate was returned from the film processing room, we were able to see vertical slices through the helmet at lcm. intervals from top to bottom. Despite the thickness of the well-preserved iron plates of which the helmet is constructed, we found we were able to see details of the interior with remarkable clarity. There, sure enough, was the second cheek-piece inside, lying near the top. There also, as we had hoped, was the mail neck-guard, folded over onto itself several times, and by the clarity of the detail of the individual links, it appeared to be in excellent condition. Among other interesting details we could see that a small stud or clip in the middle of the inside face of each cheek-piece was also visible, fastenings perhaps for a chin strap, and also fixing links and rings associated with the mail. These were all interesting details of construction that were not previously visible.



The Coppergate helmet about, to enter the York District Hospitalbody scanner.

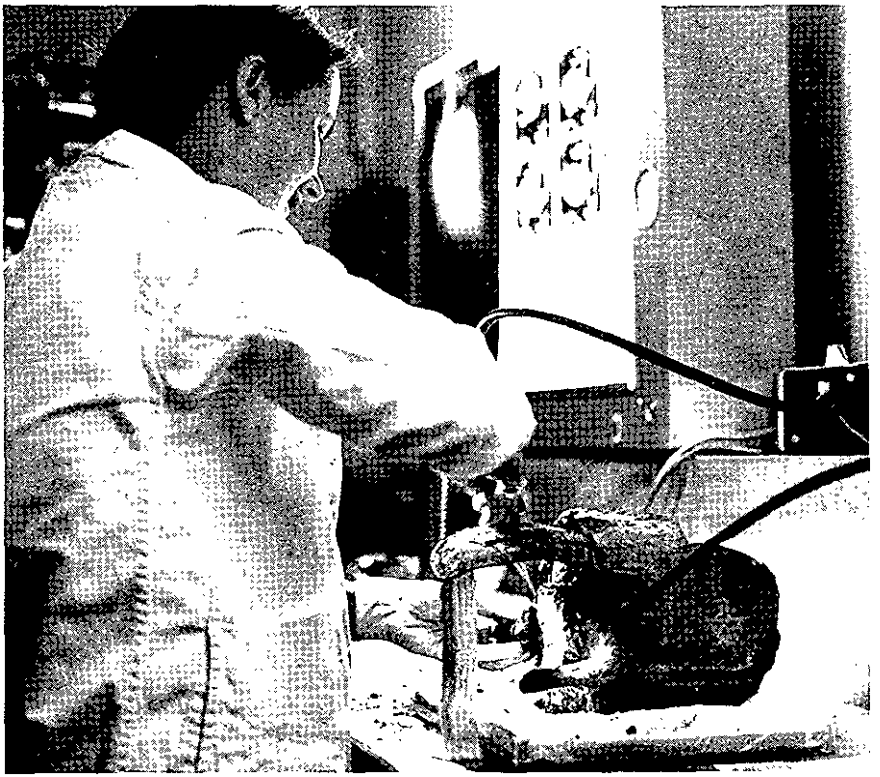


Tomogram 15 of the Coppergate helmet showing the chain mail and second cheek piece inside. The section also reveals component plates and borders to the inscriptions.

At this stage, the helmet was still resting on its side in the position in which it had been found, and we were hoping to be able to excavate the contents from the neck opening in horizontal slices, but what we had so **far were** vertical views, and we certainly did not want **to** have **to alter the** position of the helmet inside the box for fear of causing damage. With both sets of views, we would, be able to build up a three-dimensional image, ideal for our purposes. We put this problem to Dr Johnson, who said that our only chance of getting vertical views was by using the computer tomograph scanner, but he was very doubtful if the technique would be powerful enough to penetrate iron plate since, after all, hospitals are only equipped to deal with flesh, blood and bon&. The hospital had only quite recently acquired one of these highly sophisticated machines, and the staff ware secretly as keen to see what it could do as we were to get our vertical radiographs. We were all also aware that this would be the first time that an ancient metal artefact had been through a body scanner!

So it was that we stood around the control console, separated from the scanner by a thick glass screen, watching our helmet slowly being fed automatically through the circular aperture of the scanner which contains the X-ray emitters. We waited expectantly as the first tomogram image began to develop on the monitor screen and there before our eyes, better then anyone had dared to hope, we saw the outline of **the** helmet gradually thicken in the form of the metal plates, and inside it areas of differing densities representing patches of clay and looser soil within the helmet. As the succession of images were flashed up on the monitor at lcm. intervals through the length of the helmet, we saw other features – small spherical patches which could be stones; a dark band just inside the helmet, which was probably a void, and most interesting of all, the cheek-piece and mail again, embedded in a clay and soil matrix. The medical staff seemed even more surprised and pleased at the success of the technique than we were. And, as we drove back into York to return the helmet to the strong-room where it was being stored, we realized that in just one afternoon we had gained about as much information about the object as it is possible to get, without having to disturb the object, or even touch it. It had been a classic example of non-destructive examination, and we had a set of X-ray plates and tomograms which would be invaluable in the later stages of conservation.

Apart from the information revealed by the radiographs that we had had taken at the hospital, we were also anxious to discover something about the chemical composition of the various metal components in the helmet. **The somewhat unfortunate mode of** discovery of the helmet by mechanical digger had caused one of the iron plates from the side to be torn away. This plate happens to incorporate two of the elements of the copper alloy



Mrs. Julie Jones removing the contents of the helmet.

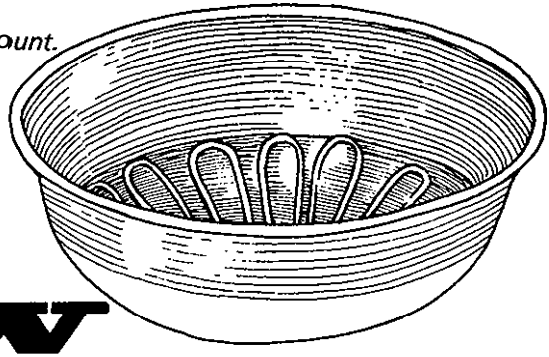
decoration – a short section of the inscription and fixing strips – and one or two rivets from the edge of the plate. Although for reasons of security the movement of the helmet itself is severely restricted, we were able to take the loose plate to Bradford University to be analysed by X-ray fluorescence. Mr Chris Caple, whose own research work involves the analysis of metalwork from York, was able to identify the copper alloy components as being of pure brass. There were also indications that the iron plate may have been surface treated with an arsenous compound, the reason for which still remains a puzzle.

By mid June we felt that we were in a position to undertake the first major operation, which was to remove the damp clay and soil from the interior of the helmet, and retrieve the loose cheek-piece and the mail. This delicate task was achieved by Julie Jones, one of our conservators, over a two day period in a small room in the basement of the Yorkshire Museum where the helmet is being stored. Although there was so little room, there seemed to be quite a crowd of people forming the 'back-up' team for the operation. Using the computer tomograms as a guide, Julie slowly cut away the clay and soil from the interior, keeping samples of even/thing that was removed for analysis. Progress was documented not only by drawing and conventional photography, but also by sound video, and an independent running commentary on tape. Every stage of the conservation process will be recorded as fully as possible by these means to provide material for publications end broadcasts, as well as for the normal archaeological finds archive. The operation was entirely successful, and the emptied helmet was still remarkably robust despite its violent means of discovery, and the removal of the supporting clay from within. The loose cheek-piece was found intact, but in poorer condition than the other, and the mail was found in a folded lump stuck together with soil, but otherwise in seemingly excellent condition. In fact, the mail was still attached to the rear rim of the helmet by three links which still articulate – a healthy sign in one respect, but making it impossible to remove the mail for separate treatment without having to cut the links.

After further consultations have taken place, the next phase in the conservation process will be to clean all the corrosion and dirt from the surface, so at last revealing the decoration and detail in all its glory. This work will be carried out by Sonia O'Connor. We already know that the brass decoration on the helmet is still bright and shiny under the thin layer of dirt, and we hope that beneath the corrosion covering the iron a smooth, dark, even shiny surface will survive. We shall have to wait and see. In the meantime we have been able to let the helmet slowly dry out, and as it is now in a dessiccated state, the nitrogen atmosphere in the container is no longer necessary. After all the special provisions we made to ensure the survival of any organic materials should there be any inside the helmet, we have learnt one thing – there weren't any.

Jim Spriggs

Anglian glass *bowl* ***from the Mount.***



a new angle on york

With the collapse of Roman administration in the early years of the 5th century, York all but vanishes from the historical record, not to re-appear until AD. 627 when Bede notes that King Edwin of Northumbria was baptised by St. Paulinus in York, in a wooden church specially built for the occasion, and dedicated to St. Peter. In these missing 200 years there were great upheavals in the North of England, which saw the end of whatever sub-Roman successor states had emerged after the collapse of Roman authority, and their displacement or absorption by two new Kingdoms, Bernicia and Deira, ruled and no doubt partially peopled by pagan Angles coming from southern Denmark across the North Sea. By the time King Edwin was baptised these separate kingdoms had been fused into one – Northumbria – in its heyday comprising the area from the Forth to the Humber. The choice of York for King Edwin's baptism suggests that by the early seventh century it was already a royal centre, and in the succeeding years it grew in importance to become probably the premier royal centre of Northumbria, with a great cathedral, the seat first of a bishop, and later an archbishop, and a justly famous library and school.

The role of York in the Northumbrian kingdom before the Viking invasions can be partially reconstructed from the surviving historical documentation, scanty though this is, but of the physical aspect of the city, and the daily life of the inhabitants in this period we are largely ignorant, for these are not things for which the historical documents provide much information. It is these aspects of the period which we might, look to archaeology to illuminate, but sadly archaeology has not been as informative for the Anglian period of York as it has been for the Roman, Viking, and medieval periods.

For the missing 200 years between c.400 and 627 AD. archaeology does provide some clues in the pagan Anglian cemeteries which have been discovered outside the city walls. The first of these was discovered in 1859 during building operations at the junction of The Mount and Dalton Terrace. Several cremation urns were saved and donated to the Yorkshire Museum. A fine glass bowl discovered on the Mount in 1807 presumably came from the same' cemetery. Excavations in 1950-56 by Ian Stead rediscovered the position of this cemetery, and fragments of several more 5th-century cremation urns were recovered; York's second pagan Anglian cemetery was found in 1878-80 during the cutting of the railway line at Heworth. A large number of cremation urns were discovered, some of which are now in the Yorkshire Museum, although many more were destroyed. These cremation urns probably date from the 5th and 6th centuries. The cemetery at Lamel Hill was also a nineteenth- entury discovery, although this time the discovery resulted not from building works, but from an excavation, conducted in 1847-8 by James Thumham, an excavation which was exemplary in its day. Thurnham recorded a number of inhumations oriented east-west, and with the bodies placed in coffins, without grave goods. However, an examination of the published drawing of the iron objects which Thumham identified as coffin fittings, reveals that some of them at least are the hinges and corner-mounts from small wooden caskets. The fact that these burials were inhumations not cremations, oriented east-west, and without grave goods lead Thumham to suggest that this was a Christian cemetery of the 7th or 8th century. The re-identification of some of the finds as parts of caskets removes one link in this argument, and It seems likely that this is one of a number of pagan cemeteries known from the 7th century which are virtually without grave goods. It is possible that another pagan Anglian cemetery awaits discovery in the Castle Yard/Clifford Street area, since the Castle Yard has yielded a fine 7th-century hanging bowl, and a bronze bowl of similar date imported from Coptic Egypt has come from nearby Clifford Street. It is possible, therefore, that the Roman cemetery in the Castle Yard area continued in use into the Anglian period, as did the Roman cemetery on the Mount.

These cemeteries around York suggest that there was an Anglian population in the area in the 5th. 6th, and 7th centuries, but so far little of this period has been discovered within the walls. The fragment of a Frisian type bone comb from Blake Street (INTERIM) belongs to this period, as do sherds of grass-tempered pottery from a pit in Lendal, and a multi-coloured glass bead from Jubbergate, but there is nothing more substantial, although some finds have been lost. There is for example, a terrifying account in the 1891 Yorkshire Museum Handbook, 'another Anglian glass vessel...was found in York about fifteen years ago, by a workman... He was holding it in. his hand near a candle whilst I was getting the money to

pay for it, when the heat caused it to break into a hundred pieces, with a noise like the report of a pistol'. The reason for this scarcity of finds may simply be that we have simply not struck lucky in our excavations; after all we have dug less than 1 per cent of the area within the walls, and only a small part of that down to a level where we might expect to encounter Anglian features. Alternatively, it has been suggested by Hermann Ramm that the city was rendered uninhabitable in this early Anglian period by flooding. He has put together evidence for flooding from many minor excavations and building works in the city, and suggested that the critical level for flooding was about 35ft above OD. However, we found no evidence for flooding on our Skeldergate site (INTERIM), much of which lay below this level, nor on Coppergate.

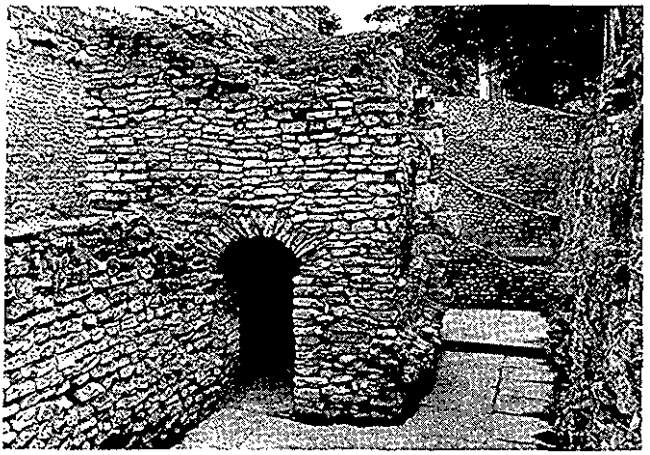
With the coming of Christianity to the city, as noted above, we begin to get documentary evidence once more, and occasionally this gives details of the fabric of the city, particularly of its churches. Bede, for example, records that the first Minster, built in 627, was made of wood, although a stone church was begun soon afterwards. In 669 St. Wilfrid found the Minster ruinous, re-roofed it in lead, glazed the windows, and whitewashed the walls. In 741 the Minster was destroyed by fire. It was probably swiftly repaired, but soon afterwards was rebuilt by Archbishop Aethelberht (767-78). Again little is known of the appearance of this new church, but in 801 Alcuin gave a gift of 100lbs of tin for 'screens of lattice' in the belfry, so it must have had a tower. Alcuin in his poem on the Church and Saints of York also gives some details about the internal fittings of the new Minster. Aethelberht he says,

> . . ..built an altar wide and high
> and covered it with silver, gold and gems
> . . ..above he hung a candelabrum high,
> and by the altar he put up the cross,
> and cased it round in precious minerals.

Aethelberht also gave another altar,

> He made another altar also clad
> in finest silver and precious stones...

Moreover, Aethelberht improved the Minster library to make it one of the greatest libraries in western Europe. Again Alcuin is a fund of information, and in his poem provides a long, and, it must be admitted, unbearably tedious catalogue of the authors represented in it, authors which included Greek and Roman writers. During Aethelberht's pontificate the Minster



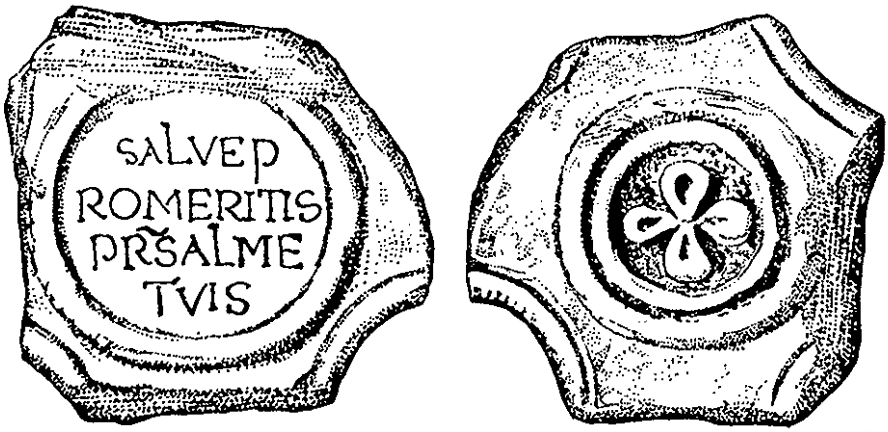
The 'Anglian Tower' inserted into a breach in the Roman fortress wall (left foreground).

school also flourished, its most brilliant pupil, 'and later master, being Alcuin, who was invited by Charlemagne to join his court in Aachen where ha wielded great influence in the ecclesiastical policy and reforms of the Carolingian Empire. No content with rebuilding the Minster Aethelberht built a church of the Alma Sophia (Holy Wisdom), again described by Alcuin,

> A lofty building raised on solid piers
> supporting rounded arches, and within
> fine panelling and windows made it bright,
> a lovely sight with gleaming cloisters round
> and many upper rooms beneath the roofs
> and thirty altars variously decked.

Aethelberht also built an 'aula' of St. Mary, but about this we have no further information. Indeed it is unclear from the reference whether this was part of a larger structure; or an independent building.

It might be thought that there should be good archaeological evidence for these major structures described by Alcuin and others, but sadly this is not so. The Anglo-Saxon Minster was always thought to lie beneath the present Gothic structure, and indeed some of the walling in the crypt was optimistically regarded as of 8th-century date. The excavations by Derek Phillips under York Minster have definitely disproved, this, but they have also failed to locate the Anglian Minster, although a number of Anglian grave slabs with fine inscriptions, and other sculptured fragments ware discovered. These suggest that the Anglo-Saxon Minster must be close by.



Both sides of a fragmentary Anglian cross head from St Mary Bishophill Junior.

If nothing of the structure of the Anglian Minster survives, neither is there now any manuscript which survives from the library, or which might have been made in York. It has been suggested that the 8th-century gospel fragment now preserved in the church of St. Catherine, Maaseick, Belgium, is a product of the York scriptorium, but this attribution is not convincing, and the manuscript appears to be the product of a continental scriptorium, albeit under strong Anglo-Saxon influence. However, all is not lost, and if the Coppergate helmet is a York product, analysis of its script and decoration may go some way towards reconstructing the repertoire of manuscripts written and illuminated in the city.

With the other churches built by Aethelberht – the Alma Sophia, and the 'aula' of *St.* Mary – the situation is even worse than it is with the Minster. The site of the Alma Sophia is totally unknown. The 'aula' of St. Mary may be on the site of either of the present day churches of St. Mary Bishophill Junior or Senior. Alternatively it might lie beneath the church of St Mary's Castlegate. There have been excavations on all sites. The excavations at St Mary's Castlegate have produced no substantial evidence for a pre-Anglo-Scandinavian church on the site. Those at St. Mary Bishophill Senior have demonstrated that the church was not founded before the 10th century, while L.P. Wenham's excavations at St Mary Bishophill Junior have produced evidence for an early Viking-Age cemetery. However, there is evidence for an earlier church on this site, in the form of a fine 9th-century cross shaft, and an inscribed cross head of the 8th or 9th century, which have been found here.Other Anglian stone sculptures have come from the cutting of the arches through the city wall near Lendal bridge, and from the site of St. Leonard's hospital, and it seems likely, therefore, that there were Anglian ecclesiastical foundations on or near these sites.

Unfortunately, most of the documentary references to Anglian York are concerned with church affairs or buildings, and they tell us nothing about the appearance of the rest of the city, apart from Alcuin's description of it as 'high-walled and towered'. At this point in his poem on the Church and Saints of York Alcuin is describing the Roman city, but presumably his knowledge was derived from the Roman defences which survived into the Anglian period. In fact, the Roman defences seem to have been maintained in some sort of order in the Anglian period, a fact demonstrated by the insertion of the 'Anglian Tower' into a breach in the Roman Walls, possibly some time in the seventh century. Of the secular structures inside, or indeed outside, these defences we know very little. The excavation under the Minster demonstrated that the cross hall of the Principia survived in use into the 9th century, and other Roman buildings may also have been reused. Traces of wooden structures, thought to be Anglian, have been reported from Museum Gardens and Davygate, but these are, alas, unpublished. Outside the walls the Trust has found evidence for Anglian occupation on the Paragon St. site, which produced a line of Anglian wattlework, a number of pits of this period, and a fine 8th-century enamelled cross brooch (INTERIM). For the rest our knowledge of the extent of Anglian settlement in York comes from casual finds of Anglian objects during building works, and as residual finds in later contexts in our own excavations. Some of these casual finds are, indeed, splendid, such as the pin head from St. Mary's Abbey, and the piece from Blake Street (INTERIM), but they are no substitute for the nitty gritty of archaeology: the structures and the refuse from everyday life in and around them. For this evidence even the Coppergate helmet is no substitute, although it is handsome compensation1

Extracts from the Alcuin's poem are taken from S.Allott, Alcuin of York.

D. Tweddle

The sites referred to above can be revisited in INTERIM as follows:-.

Paragon Street: vol 1 no 4 pp 38-9.
Skeldergate: vol 1 no 3 – vol 2 no 4.
Blake Street: vol 3 no 1 pp 39-40; vol 5 no 1 pp 45-6.

Alcuin's writings can be consulted most readily in ***Alcuin of York*** by S Allott (York, 1974).

POT SPOT
SUGAR & SPICE

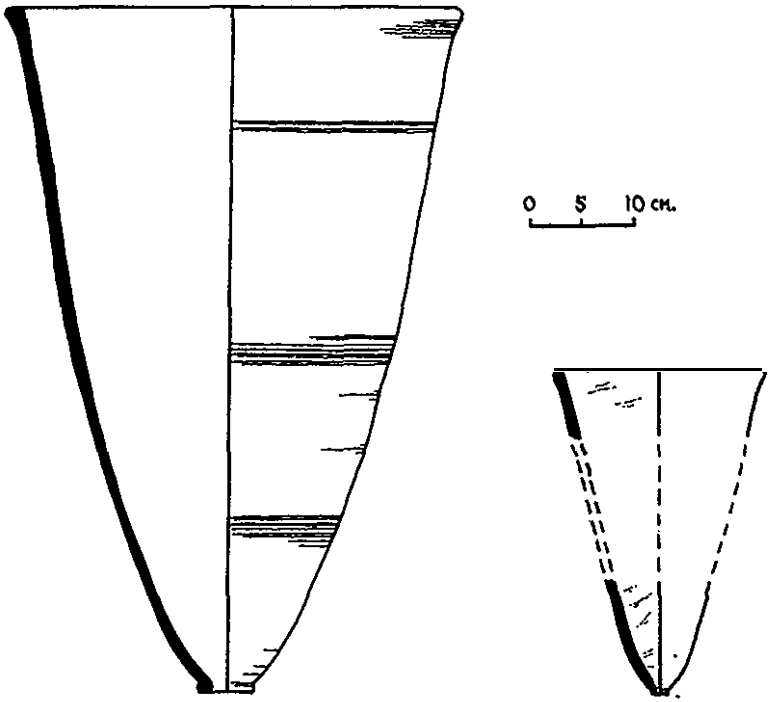


Fig. 1 Sugar-cone moulds from Skeldergate

Working through material excavated some years ago by the Trust, one sometimes comes across types of pottery which were not recognised at the time, either because of the state of knowledge then or because there was not time for reconstructing pottery during the excavation. For example, from post-medieval levels on a site on Skeldergate excavated in 1972 have come a large number of vessels now seen to be connected with sugar-refining, indicating that an industry important to York today has quite a long history here. The two vessel forms represented are sugar-cone moulds

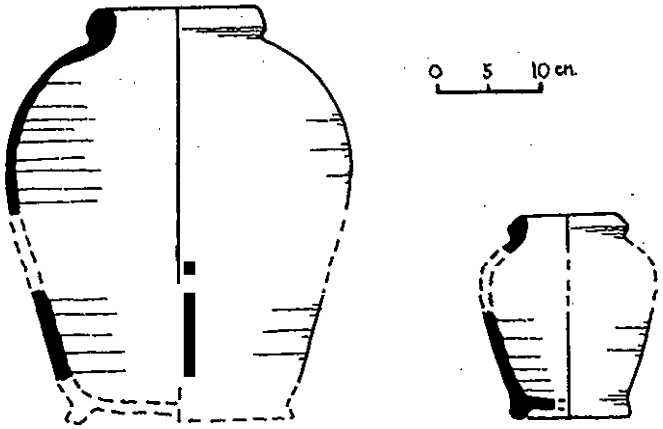


Fig. 2 Sugar-refining jars from Skeldergate

and jars. There were about *132* moulds. represented by 432 sherds; the shape is conical, with a hole pierced in the base (Fig. 1). They are in a red earthenware, and are unglazed (although a few have runs or splashes of glaze which may be accidental). A number have a smooth white-slipped finish to the interior, and many of the unsljpped vessels also have trimmed and smoothed interior surfaces; this careful finish, was presumably to facilitate the removal of the finished sugar-loaf. There appear to be three sizes of mould, for large, 'medium and small sugar-loaves.

The sugar-refining jars, which have rounded rims and ring-foot bases, *also* appear to have been made in large and small sizes (Fig. 2). The fabric of these is the same as that of the moulds, but they are always glazed internally, with a few splashes of glaze externally. The exterior of the jars is often soot-blackened in places. There were 268 sherds of this vessel form, representing about 65 jars. The group dates to the late 17th or 18th century.

Contemporary documentation gives us some idea of how these vessels were used. The raw sugar from the West Indies was processed by a 'sugar-baker'. In an account of 1747, we are told that "the Trade of a Sugar-Baker is but of late Standing in this island: He is become confiderable only since we became *possessed* of the Island of *Jamaica;* a Conquest we owe to *Oliver Cromwel. Sugar,* though an Article of Luxury, is yet of great Ufe to this Island, as our Sugar-Colonies employ an infinite Number of Hands at Home, to supply them with all manner of Neceffaries, which they pay for extravagantly, and some hundred Sail of Shipping are annually freighted to carry them Provisions and import us their Sugars.

Sugar is the Juice of a Reed expreffed by two great Iron-Rollers , turned by Negroes. The Juice is received into a Boiler, where it is boiled for a confiderable Time, and is made to granulate by mixing it with Lime. This dry Powder is put up in Cafks, in which there is a Hole left to allow the Molaffes to drain from it, and is in that Shape *fent* to Market and called Muscovadoes. When it comes to the Sugar-Baker he dilutes the Raw Sugars with Water, boils them and mixes them with Lime several Times. Till after several Dilutings and Boiling they become fit to put into Earthn Moulds of the Shape of a Sugar-Loaf, and are baked in an Oven and clayed. They are clayed in this manner, a Quantity of Water is mixed with Clay till it is thicker than Starch, and this put upon the Sugar, in the Mould upon the broad Part, which ftands uppermost in this part of the Operation: The Water fubfides through the Loaf and carries with it all Impurities, which they have not been able to take away in boiling, and the Clay remains a dry Substance on the Top. If they were to pour on Water without Clay, it would run too quickly through the Loaf and only moisten it, without carrying off the Impurities; whereas the Clay being mixed, it falls by degrees and *answers* their Purpofe."

The function of the earthenware moulds is clearly described here, but that of the ring-footed jars is less certain. The 18th-century author then goes on to discuss the workmen involved in this industry: "The *Dutch are* better Boilers than we, and we have a great Number of working Boilers from thence and *Hamburgh.* I do not find they take Apprentices, but the Labourers they employ, by degrees, learn the different Branches of it. The Boiler is the chief Workman in a Sugar-House, and earns from Thirty to Fifty Pounds a Year; the *reft are* only Labourers.

The sugar, once made into loaves, was sold by grocers, who are rebuked by the same author for raising the prices of his other commodities to subsidise the cost of handling the sugar. "There is indeed one Article which they must' fell to their Lofs, *vis. Sugars:* A *Custom* has prevailed among the Grocers to fell Sugars for the 'prime Coft, and are out of Pocket by the Sale, Paper, Pack – Thread, and their Labour in breaking and weighing it out: The Expence of *fome* Shops in *London* for the tingle Article of Paper and Pack-Thread for Sugars amounts to Sixty or Seventy Pounds per *Annum;* but this they lay upon the other Articles: The Customer had much better allow him a living Profit upon his Sugars, than pay extravagant Prices for Tea and other Commodities."

Further light was shed on the usage of sugar-refining pottery during a visit to Cyprus by the present author in August 1992. A team from Zurich University has been excavating a late medieval sugar refinery at Kouklia, near Paphos, and thousands of sugar-cone moulds and jars have been recovered (I am grateful to Professor F. Maier and Dr Marie-Louise von Wartburg for information on the site and the pottery). Each mould was seated on a jar, which caught the residue as it dripped through. The Cypriot examples vary only slightly in shape from the York ones. There are 3 sizes of mould, which were used to produce 3 qualities of refined sugar, the smallest size yielding the finest sugar. It is likely that a similar situation obtained at York.

From the 14th to the 16th century Cyprus had been one of Europe's principal sources for this luxury item, known as "poudre de Chypre", and the wealth produced by the sugar was an important political factor within Cyprus. By the time West Indian sugar was being refined in York, however, the Cypriot sugar industry had died out. A diarist of 1760 recorded that "the manufacture of sugar is wholly laid aside and the Cypriot people entirely ignorant now of the process".

Cathy Brooks

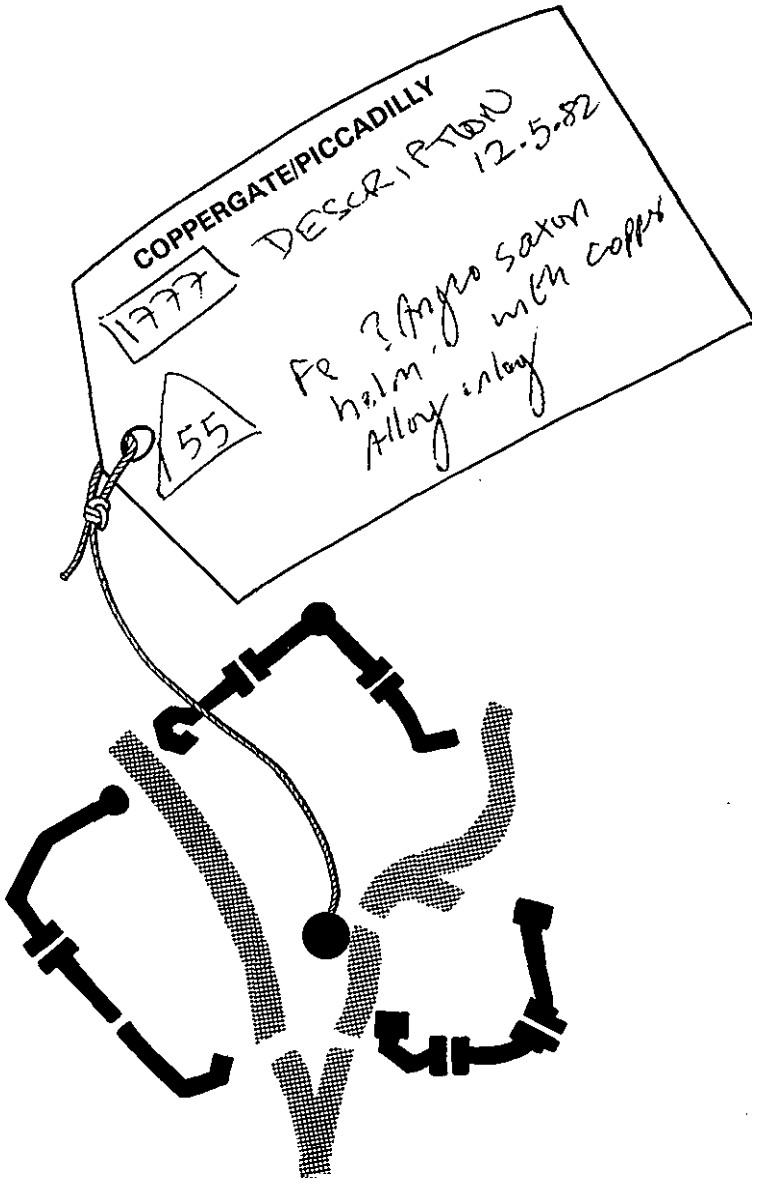
MEET THE ARCHAEOLOGIST

In this issue the searching gaze of INTERIM is turned on one of the Trust's newest recruits – Nicholas Pearson, Field Officer, and archaeologist in residence to the Coppergate development scheme.

Nick was born in Liverpool, one of six children. He was educated at the Irish Christian Brother's School, but after a trifling disagreement with one of the brothers completed his schooling at the local comprehensive. He chose to read law at University. As a result of this decision he spent three happy years at King's College London. Although Nick enjoyed the subject immensely the thought of making a career in the legal profession did not appeal (a legal pun), and instead he chose the healthy outdoor life offered by archaeology.

Nick's introduction to archaeology bad come when he was fourteen, and his initiation took place at Monkwearmouth and Jarrow, excavations directed by Prof. R. Cramp. Nick dug here every year, becoming a Site Assistant at the tender age of seventeen, and ending up as Assistant Supervisor. Finding that the open air life was the life for him, on leaving University Nick bravely went into full-time digging, and has been doing it ever since – excavating every summer and writing up in the winter. From 1976 he was involved in the excavations at the Brough of Birsay on Orkney, and interspersed work here with excavations at Hartlepool.. Bishop Auckland, Darlington, and Brandon, all of which he directed, among many others. In 1978 he also took an MA in Anglo-Saxon & Viking archaeology. Finally Nick made the move to York, firstly as an area supervisor at the Castle Garage site, and later in the deep trench at Rougier Street. He then took charge of the watching brief on Coppergate for the period of the development. It was in the course of this work that the Coppergate helmet came to light.

In his spare time Nick is another of the Trust's intrepid band of cyclists, and enjoys cycling around in the area of York, making occasional forays as far afield as Durham! Nick also enjoys rather more distant travel, and his ambition is to visit every one of the fifty or so Orkney Islands. On the international scene Nick spent part of last summer in Malaysia and Thailand, and hopes next year to travel down the Nile through Egypt and the Sudan to fetch up eventually in Kenya. In the odd moments when he is not on Safari Nick is engaged in renovating a house in York, and at the moment is up to his ears putting in central heating.


COPPERGATE/PICCADILLY
1777
DESCRIPTION
12.5.82
155
FR ? Anglo saxon
helm, inlay
Alloy inlay copper
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