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GLASS VESSEL SHERDS FROM 8TH AND 9TH CENTURY RIBE – SHAPES, DECORATIONS AND TYPES

Glass vessels in Scandinavia from the 8th-10th century AD have so far been a relatively anonymous find-group. Until the middle of the 20th century this category of finds have been represented by very few finds, and publication of the finds as a separate find group are rare[1]. Glass vessels from Scandinavia dated to the 8th-10th century AD are still rare, and complete vessels are only known from very few grave finds like Birka, Hopperstad, Hedeby and Välsgärde. The by far largest material of complete vessels still comes from the graves at Birka in Sweden[2]. A total number of 18 different vessels dated in the 10th century AD. The conclusion had to be that glass vessels were a high status luxury trading good imported into Scandinavia – but from where?

Excavations through the last decades on several market sites in Scandinavia such as Åhus, Slöinge, Uppåkra, Lofoten, Kaupang, and Ribe and outside Scandinavia on places like Groß Strömkendorf, Dorestad, Wijnaldum, Southampton and Truso have revealed a growing number of glass vessel sherds[3]. This material shows that the interpretation of glass vessels and sherds and their role are more complex than first assumed.

The glass-vessel sherds from Ribe marketplace occupy an important position within North European glass-vessel material, both on the grounds of their quantity, and also, in particular, because of the stratigraphic conditions at the marketplace, which have made it possible to establish an unusually refined relative and absolute chronology for the period c. AD 700-850. 45 years of archaeological excavations have been carried out at several stages and with different excavation-methods at Ribe marketplace, and this has resulted in finds of a total of ca. 3500 sherds of glass vessels (march 2018) (fig. 1). The method of consequently water sieving all excavated cultural layers has led to an extensive material. Only a very little fraction of a material as glass vessel sherds can be found if you do not water sieve.

The primary purpose of my dissertation was to determine whether it is possible, on the basis of the sherd material from one of the many excavations, ASR 9 Posthuset excavated in 1990-1991, to identify which shapes and types of glass vessel are represented in Ribe and whether it is possible to establish a chronology relating to their presence in the marketplace[4].

THE SHERD MATERIAL FROM ASR 9 POSTHUSET

The excavation was undertaken in 1990-1991 and covered about 100 m², of which about 80 m² was investigated right down to the subsoil. The excavation method had a strong focus on the stratigraphy and all the soil was water sieved through 2 or 4 mm wire mesh. This had a decisive influence on the number of drinking-glass sherds. Throughout the entire discussion of the material here the glass sherds will be divided according to the phase-categories that apply at ASR 9. The phase-categories have resulted in a detailed relative chronology, and with the help of e. g. scientific dating methods it has moreover been possible to date this in absolute terms[5]. The time-span for this material lies between AD 705 and about AD 850 and it thus covers 150 years (fig. 2).

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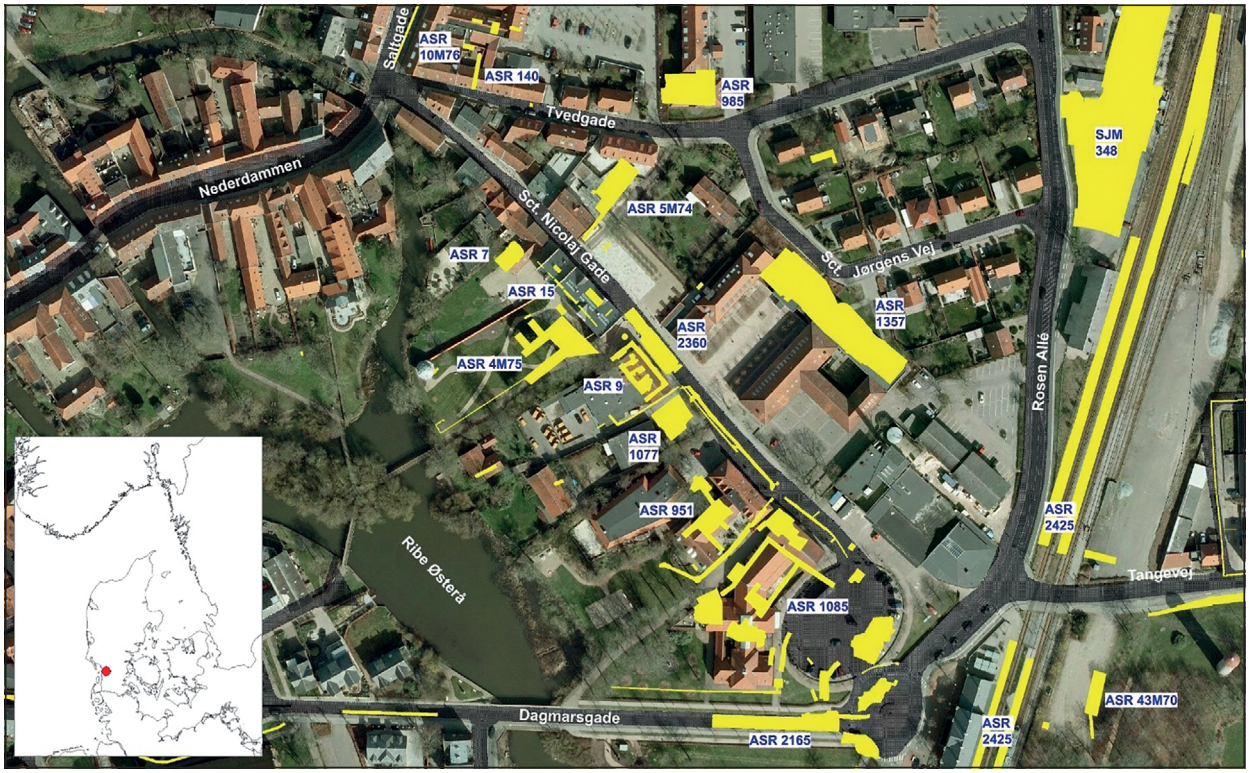

Fig. 1 Excavations in Ribe, 1970-2018. – (Map Sydvestjyske Museer).

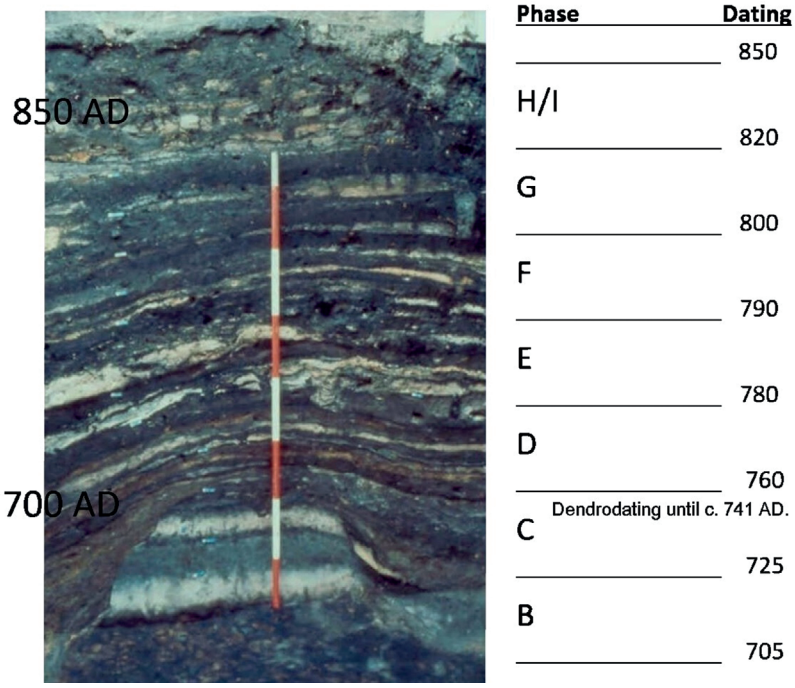

Fig. 2 In 1990-1991 C. Feveile and S. Jensen divided the layers into nine phases, on the evidence of the excavation at ASR 9 Posthuset. The two earliest of those phases AA and A are left out here, because they are distinctly earlier than the marketplace. The thickness of the phases must not be confused with the length of the phases. On the left is seen a section though the layers as seen in the excavation ASR 9 Posthuset. – (After Feveile/Jensen 2006, 15 fig. 1).

The total number of finds of glass objects from ASR 9 is 9280 pieces (Feveile/Jensen 2006, 146-150 fig. 9. 13). The glass-vessel sherds make up 1373 pieces, about 14.8 % of the glass material. Body-sherds represent by far the largest proportion, 1134 pieces, as opposed to the smaller number of rim-sherds, 227 pieces, and only 12 base-sherds (**tab. 1**).

	Number	%
Body-sherds	1,134	82.6
Rim- sherds	227	16.5
Base-sherds	12	0.9
Total	**1,373**	**100**

Phase	Number	%	Phase-length in years	Number of sherds pr. year
No phase	224	16.3		
H/I	56	4.1	30	1.9
G	36	2.6	20	1.8
F	68	4.9	10	6.8
E	246	17.9	10	24.6
D	181	13.2	20	9.1
C	424	30.9	35	12.1
B	136	9.9	20	6.8
A	1	0.1		
AA	1	0.1		
Total	**1,373**	**100**		

Tab. 1 The figure on the left shows the total number of sherds from glass vessels at ASR 9 Posthuset, divided into side, rim and base sherds, shown with the percentage of the total material represented by each of these three groups. The figure on the right shows the number of sherds per phase, percentage share of the sherds per year, and number of sherds per year in a phase. The length of the phases is indicated in accordance with Feveile/Jensen 2006. – (Table L. Lund Feveile).

The size of the sherds generally lies between 0.5-2.0 cm. This is a very fragmented material. It is a feature also seen on other archaeological sites. The fragments of glass vessels occur frequently over the whole of the excavated area, but predominantly in the areas defined as inside a plot or covering the narrow ditch areas between two plots. Considerably fewer sherds of glass vessels were found in areas dominated by ditches and road structures, not actual activity areas.

A distinct dominance of glass vessels can be seen in phases C, D and E. The same applies even if one divides up the sherds into body-sherds and rim-sherds. It is clear that there was a dramatic decrease in the number of glass vessels from phase F and onwards. The clearly dominant glass-vessel sherds are pale green (51.3 %) and pale blue (24.3 %) (**tab. 2**).

The substance of the glass is very homogeneous. In all cases the glass is fine and clear with a larger or smaller number of air-bubbles. Impurities or faults in the glass are practically non-existent. Chemical analyses of the glass-vessel sherds from the earlier Ribe excavations show that when the glass can be related to the 8th or 9th centuries it is always sodium glass. The same must be assumed to be true of the material from Posthuset, but no chemical analyses have been made in connection with my work with the material.

The decorated sherds make up 31.9 % of the total material. In phases B, C and D the proportion of decorated sherds is between 35 and 40 %, while in phases E, F, G and H/I it falls to between 15 and 30 %. There is thus a tendency towards a decrease in the number of decorated glass vessels over time. The variation in decorative elements also seems to shrink over the course of different phases. The tendency, therefore, seems to be towards fewer shapes of glass vessels and less variation in the decorative elements (**tab. 3**).

Like pottery the rim area is a significant part of the vessel. It has proved possible to sub-divide the rim-sherds into various rim-variants, labelled a to g (**fig. 3**).

Rim variant a is a thick hollow folded-over rim, in all cases turned inwards. The cavity at times seems accidental, but in most cases, it has clearly been a planned element of the glass vessel.

Rim variant b is a thick round rim, reminiscent to a certain extent of rim variant a, in that the profile of the two types of rim is the same. Variant b, however, has a solid rim. It often looks as if a thread has been placed near the rim and the rim has been bent down over it; as with variant a, the rim is always bent inwards.

Phase	Black	Red	Blue with red	Amber coloured	Dark olive	Turqoise-bluegreen	Dark blue	Dark green	Pale blue	Pale green	Clear	Yellow-brown	Pale Yellow	Light olive	Red-brown	Greenish yellow	Total
No Phase					4	3	4	17	50	115	24		2	3	2		224
H/I	1						1	4	5	43	1			1			56
G					1	3		5	5	16	3				2	1	36
F					1		1	2	25	29	6	1	1	1		1	68
E		*1		1	2	5	1	11	76	114	24	3	3	3	1	1	246
D	1					3	2	15	45	104	8	1	1	1			181
C	7	3	1		9	14	7	15	106	232	28	1			1		424
B	2			2	4	7	3	36	22	51	7		2				136
A												1					1
AA						1											1
Total	**11**	**3**	**1**	**3**	**21**	**36**	**19**	**105**	**334**	**704**	**101**	**7**	**9**	**9**	**6**	**3**	**1,373**

Tab. 2 Colours of the glass-vessel sherds divided into phases. – ***** Glas inlaid using cold technique. – (Table L. Lund Feveile).

Phase	With deco-ration	Without deco-ration	Total	% of sherds with decoration
No Phase	55	169	224	
H/I	16	40	56	28.6
G	8	28	36	22.2
F	12	56	68	17.7
E	62	184	246	25.2
D	67	114	181	37
C	164	260	424	38.7
B	52	84	136	38.2
A	1	0	1	100
AA	1	0	1	100
Total	**438**	**935**	**1,373**	**31.9**

Tab. 3 Decorated and undecorated sherds of glass vessels divided into phases, with the percentage share of decorated sherds in relation to the total number of glass-vessel sherds in phases. – (Table L. Lund Feveile).

The following variants, c-g, have in common the feature that they are more delicate than rim forms a and b.

Rim variant c. The profile of the rim-sherd shows a more-or-less equal curving of the rim on both sides of the sherd. This is called a staff-shaped rim.

Rim variant d is a thickened inward-turned rim. This means that on the inner side of the rim there is a larger or smaller rounded lip.

Rim variant e is thickened without any conspicuous rounding to either side.

Rim variant f is a broad flat outward-turned rim. Often there is a cavity inside the turned rim. The type is only found in this material when there is decoration with thin yellow horizontal trails. The trails are laid on the outer side of the glass vessel and the rim is then bent outwards and downwards.

Rim variant g is an incalmo rim – an applied broad flat rim in a colour different from the main colour of the glass vessel. In the glass-vessel material from Posthuset incalmo rims are only found in shades of turquoise and green. From Birka, grave 644, a dark red incalmo rim is known[6].

89.2 % of the sherds were found in phases B to E, and only 10.8 % of the rim-sherds were found in phases F to I. Most of the sherds are of types d and e. There is a gradual change from thickly-shaped rims to rims that are only slightly thickened, and finally they become completely evened out. Sharply cut-off rims as in the

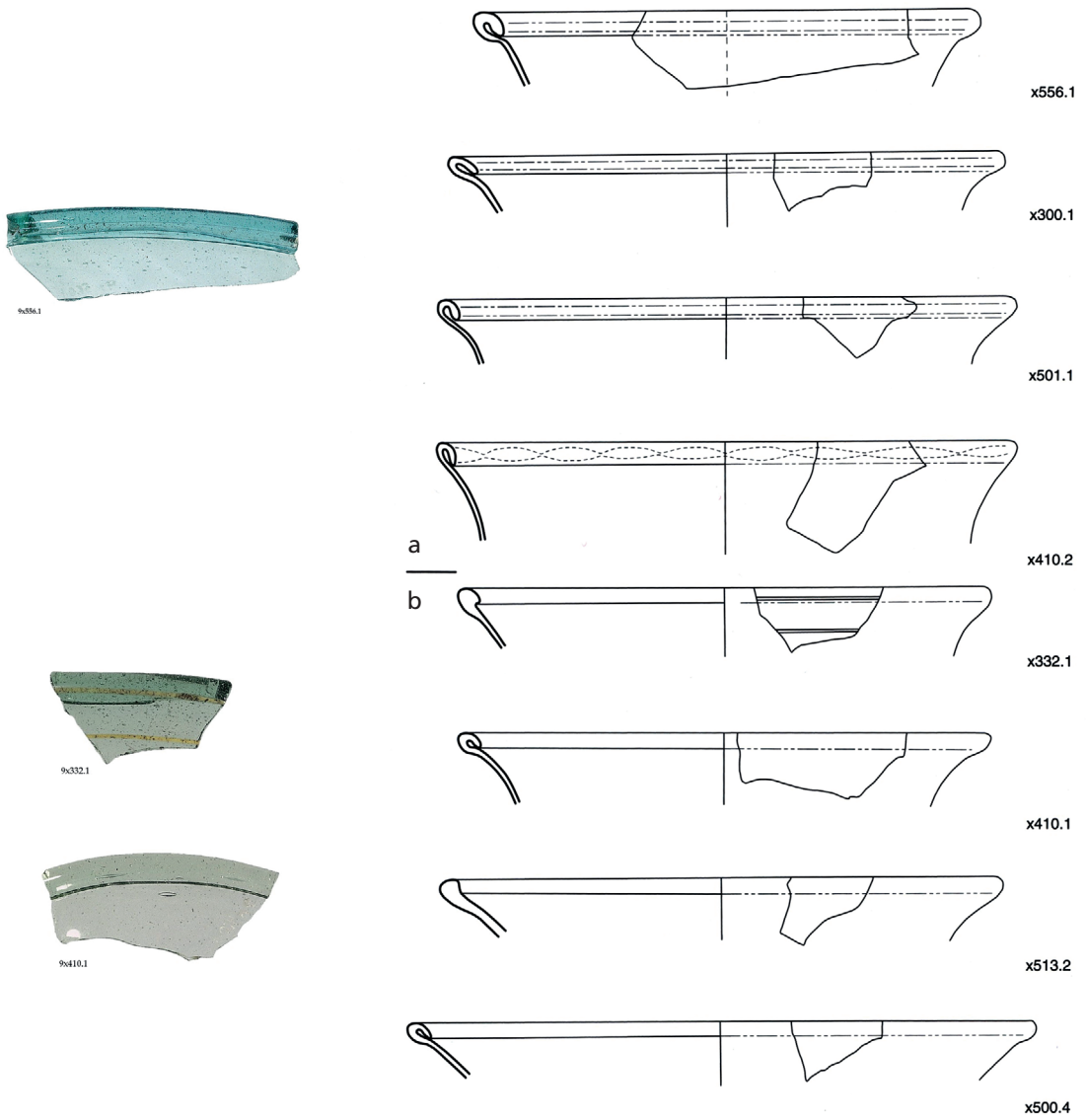

Fig. 3 Development of the rim from variant **a** to **g**, from ASR 9 Posthuset. The different variants follow each other – but do not necessarily exclude each other; variant **a** being the oldest and variant **g** the youngest. – (Photos Sydvestjyske Museer; drawings S. Hendriksen, Museum Sønderjylland).

earlier Roman glass-vessel material are not known from the vessels of the 8th and 9th centuries[7]. The thick rim shapes (**fig. 3a-c**) hollow or solid, are the earliest from the marketplace. They do not occur after phase E. In phases B-C there were also the only three rim-sherds that may possibly be linked to a glass vessel of the claw beaker/Snartmo type. Rim variant f is only found in four examples scattered over the whole period. Rim variant g is a late rim variant that does not occur in Ribe until phase G, and supplements variant e. One can conclude, taking into account comparison with the known whole funnel beakers, that thick hollow and solid rims belong to the earliest glass layer-sequence in the Ribe material and therefore are particularly associated with palm-cups and palm-funnels, whereas variants d, e and g are particularly linked with the later phases and thus to the funnel beakers. All rims that seem, on the basis of the glass type, to belong to funnel beakers with a ridge have rim shape e.

It has only been possible to measure the rim diameter of 150 sherds, and these measurements have to be treated with some caution. There is a large group of rim-sherds from glass vessels with a diameter between 9 and 12 cm, no matter which vessel type or phase.

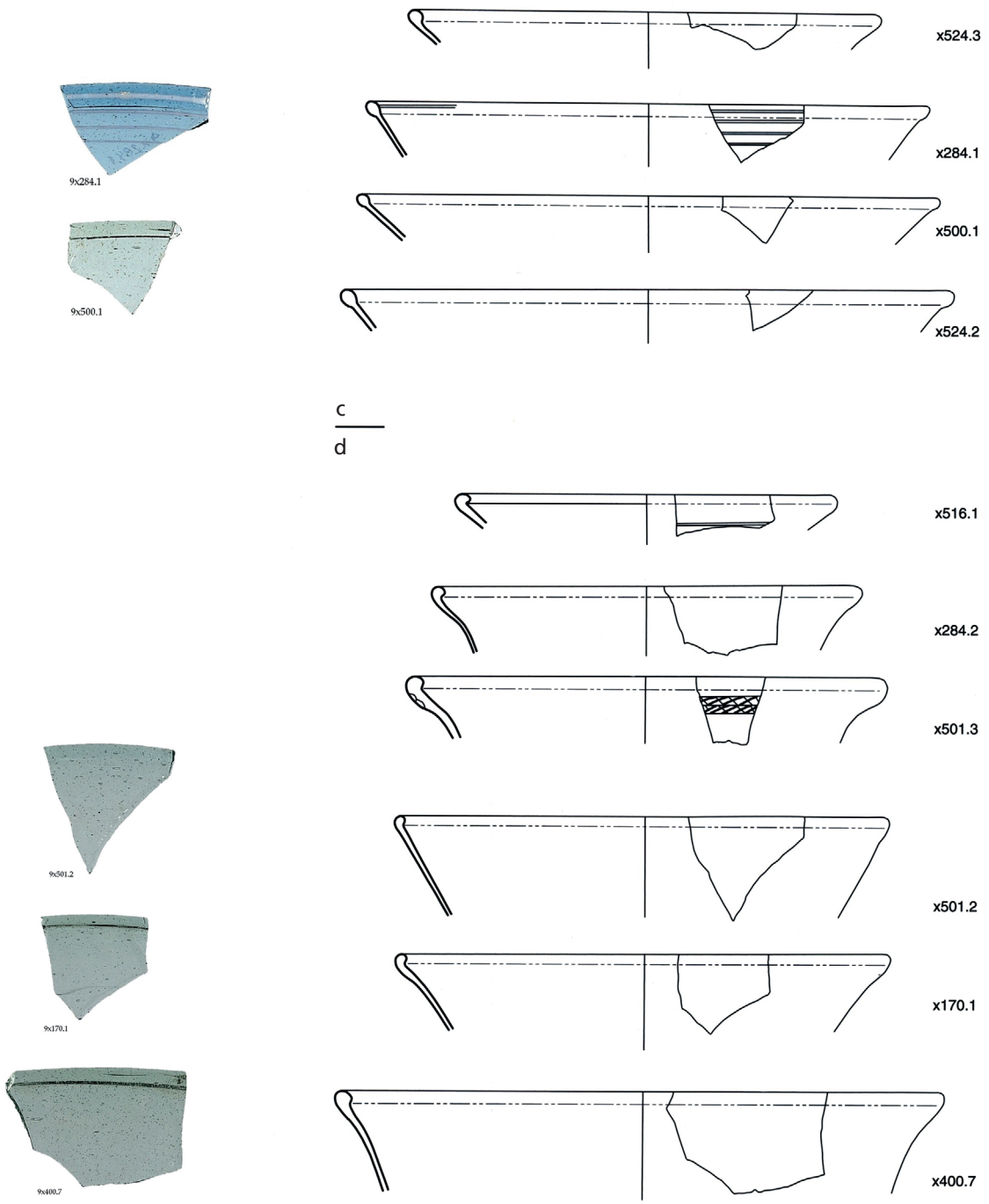

Fig. 3 (continued).

Glass vessel shapes

The sherds of glass vessels from the 8th-9th centuries can be related to a number of basic shapes: palm-cups, funnel beakers/palm-funnels, bowls, squat jars and a group of unknown shapes. All types are considered to be West European shapes. The palm-cup is the earliest and developed gradually into the higher and narrower palm-funnel before ending in the fully developed funnel beaker. The Ribe material contains sherds of glass vessels of all types and with different decoration.

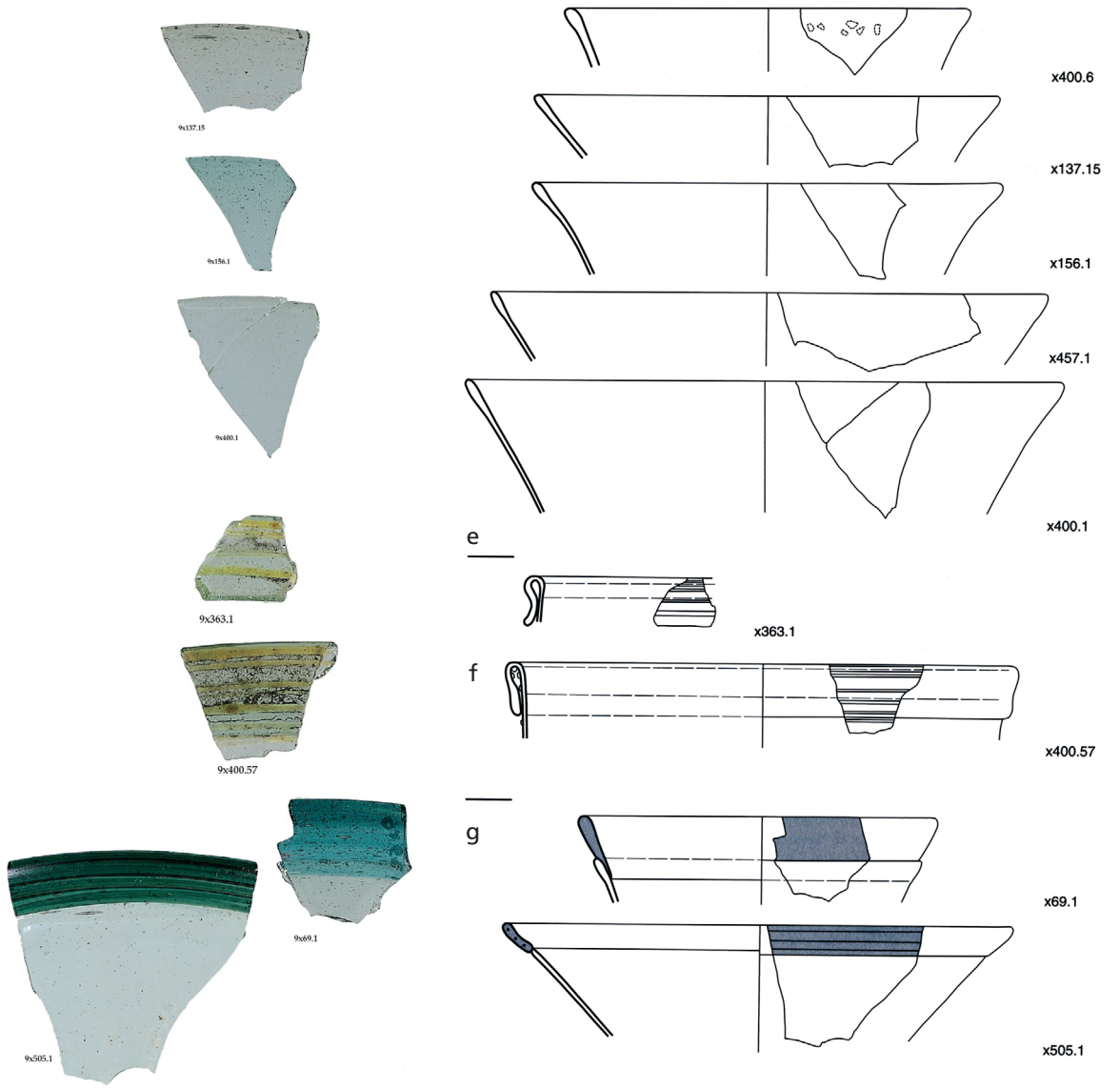

Fig. 3 (continued).

Decoration

Many different forms of decoration are to be seen in the material: reticella, applied trails, optic blown, flamed/red, gold foil and incalmo (**tab. 4**).

There are in all 89 sherds with reticella decoration in the material from Posthuset, distributed throughout all phases, but the largest quantity is in phases C and D. 72 out of 89 sherds have yellow twists around the strands. The technique reticella will not be discussed here. Vertically placed reticella rods are dominant in the material. Only in one case from Posthuset (x457.4) is the base trail of the reticella rod of a colour other than the sherd itself. On 18 sherds of glass vessels there is a combination of reticella rods and horizontal trails, most commonly yellow but also in some cases white applied horizontal trails. This combination of reticella rods and trails is also known from the Valsgärde 6 bowl[8]. 81 % of the sherds of glass vessels have a basic colour that is faintly green or faintly blue. Finally there is a rim-sherd (x501.3) with two reticella rods horizontally under the rim. Reticella decoration of a rim section like this has not been seen before, although a rim-

	Reticella	Applied trails	Optic blown	Arcade	Flamed / Red	Gold-foil	Incalmo	Other types	Total	Number of different decorations
No Phase	15	37	1	3	2			4	62	
H/I	5	8			1		3		17	4
G	2	6					2		10	3
F	2	7	1	1		1		1	13	6
E	11	49		10	2	1		2	75	6
D	9	52	2	12	8				83	5
C	40	105	17	23	4			2	191	6
B	5	35	12	2				1	55	5
A		1							1	
AA		1							1	
Total	**89**	**301**	**33**	**51**	**17**	**2**	**5**	**10**	**508**	

Tab. 4 Decorative elements divided into phases. There are 508 instances of decoration elements divided into in total 438 decorated sherds. On several sherds there is a combination of several decorative elements, if so then the sherd is included in each of the groups for the decorative elements concerned This applies in particular to the decorative element named reticella, which is often combined with applied trails, and to garland decoration, which is also included in the category of applied trails. – (Table L. Lund Feveile).

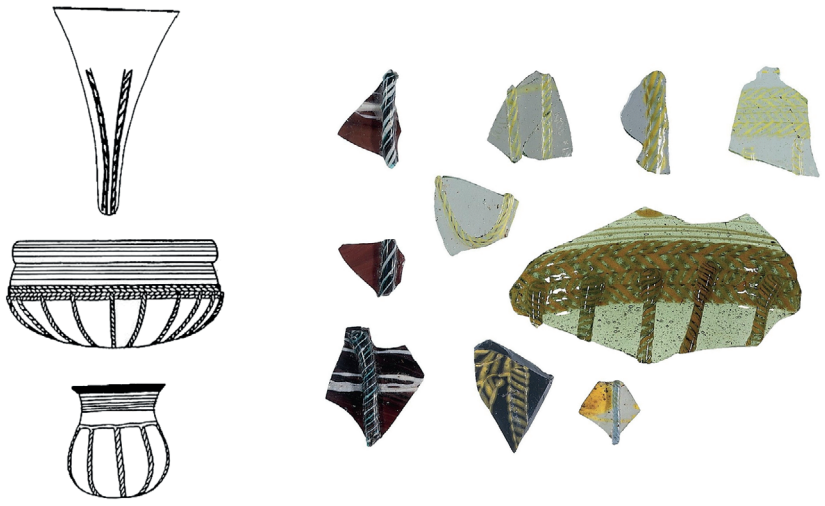

Fig. 4 Vessel sherds and types with the decorative element reticella from several excavations in Ribe. – (Photos Sydvestjyske Museer; drawings U. Näsman, 1984b).

sherd from Ibligno-Invillino in Italy may be similar to the Ribe sherd[9]. Rim-sherds with a reticella rod in the rim, as known from Southampton and Kaupang, are not present in the material from Posthuset but were found during the SJM 3 Posthustorvet excavation in 2017-2018. The place of production of glass vessels with reticella rod decoration is not known. Ireland, England and France/Belgium have been suggested. Few examples are known from the areas where the type seems to have been produced. Decoration with reticella can appear on glass vessels in the form of funnel beakers, bowls, squat jars, and unidentified shapes (**fig. 4**). There are 301 sherds with applied trails. By this is meant sherds of glass vessels with the simple decoration of applied trails of either the same colour as the rest of the vessel or a contrasting colour. The group »trails« is divided into a number of variants: opaque trails, trails in garland decoration, and trails in the base colour (**tab. 5**).

	Trails in arcade	Trails in base colour	Yellow trails	White trails	Yellow and white trails	Other	Yellow trails in combination with reticella rods	White trails in combination with reticella rods	Total
No Phase	3	6	19	1	2	2	3	1	37
H/I			5	2	1				8
G			1	1	3			1	6
F	1	2		3			1		7
E	10	2	29	2	2	1	3		49
D	12	5	26	1	3	1	4		52
C	23	15	51	1	9	2	4		105
B	2	21	8		1	2	1		35
A		1							1
AA		1							1
Total	**51**	**53**	**139**	**11**	**21**	**8**	**16**	**2**	**301**

Tab. 5 Vessel sherds with the decorative element applied trails from Ribe. – (Table L. Lund Feveile).

Opaque trails are found in two colours, yellow and white. As can be seen, the dominant form of decoration consists of applied yellow trails, and this makes up almost 60 % of all sherds with applied trails. By garland decoration what is usually meant is trails in the base colour applied in curves and melted down into the glass. The garlands are heftier and broader than ordinary applied trails and cannot be confused with the trails laid in arches as on the earlier cone beakers and long-necked beakers. From Birka there are two known examples with garland-like decoration but those vessels have a different irregular net-like appearance [10]. In the material from Posthuset there are sherds with both double and triple garlands. The decoration formed by trails in garlands is associated with vessel forms of palm-funnels and funnel beakers. Trails in the base-colour is a form of decoration that belongs to the earliest phases. These very fine horizontal threads that almost are not attached to the glass are known as decoration on glass types from the 4th to the 7th century, such as claw beakers, cone beakers and drinking horns [11]. In Ribe they were found in rather small numbers from the first half of the 8th century.

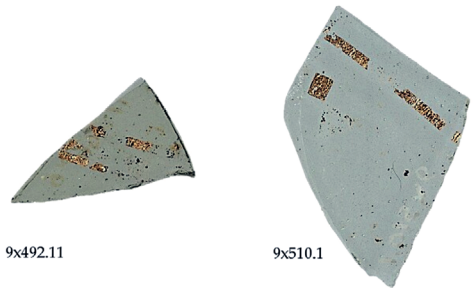

Fig. 5 Vessel sherds with the decorative element geometric gold-foil from Ribe. – (Photos Sydvestjyske Museer).

In the material there are in all 33 fragments of optical or mould-blown sherds. This optical effect of fluting in the glass occurs when the glass is blown into a mould. There are 17 sherds in the material that have »flamed« decoration, and of these 9 sherds probably come from the same vessel.

From the excavation at Posthuset there are two sherds with traces of geometric gold foil decoration (x492.11 and x510.1; **fig. 5**). Both sherds belong to phases E and F, i. e. the end of the 8th century. A third piece was recently found in the SJM 3 excavation, presumably with the same dating.

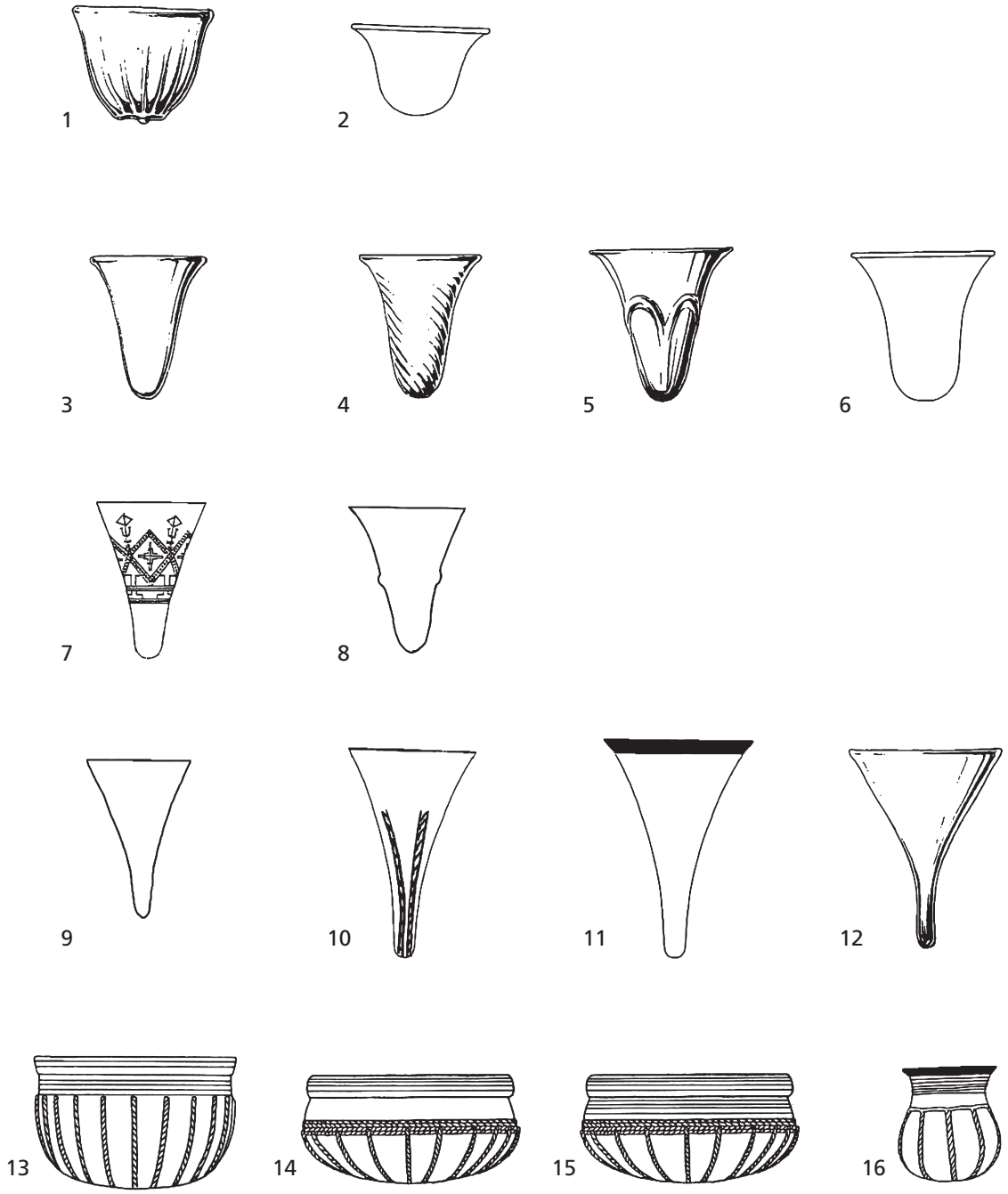

Fig. 6 The most frequent glass-vessel types in the years between 700 and 850 AD, found at the marketplace in Ribe. The numbers 5, 7, 8, 10, 11, 13/15 and 16 are described in this article, the rest can be found in Lund Feveile 2006: **1** Palm-cup with rib pattern. – **2** Palm-cup with turned-over rim. – **3** Palm-funnel. – **4** Palm-funnel, optical blown. – **5** Palm-funnel with garlands. – **6** Palm-funnel. – **7** Palm-funnel with geometrical gold-foil. – **8** Palm-funnel with carination. – **9** Funnel beaker. – **10** Funnel beaker with vertical reticella. – **11** Funnel beaker with incalmo rim. – **12** Funnel beaker with slim foot. – **13** Bowl with reticella type a. – **14** Bowl with reticella type b. – **15** Bowl with reticella type c. – **16** Squat jar with reticella and incalmo rim. – (1, 3, 4, 5, 12 after Ypey 1964; 2, 6, 11, 13, 14, 16 after Näsman 1984b; 1990; 7 after Henderson/Holand 1992).

The term incalmo is used to describe a broad applied rim of a colour other than that of the vessel itself. Most often the rim is in blue-green shades but occasionally other colours appear. At the ASR 9 excavation, only five sherds of this type were included in the find-material. Two sherds can be linked to the funnel beaker form. Two are possibly linked to squat jars (fig. 3, rim variant g).

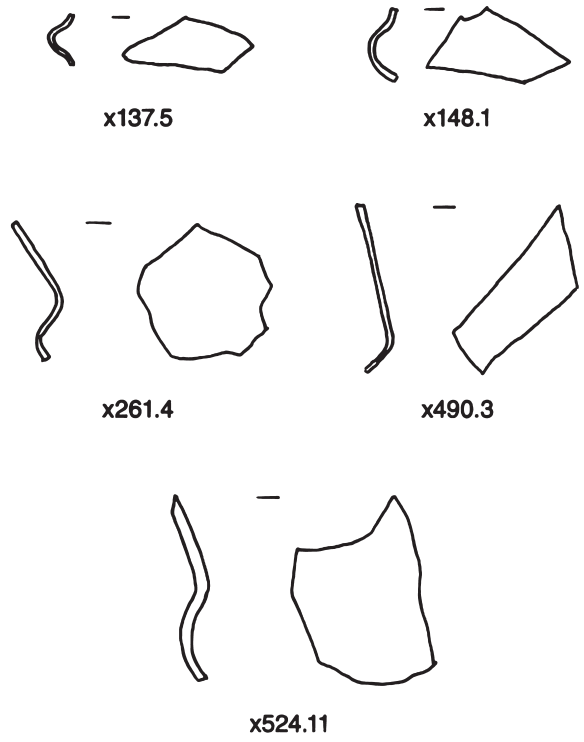

Fig. 7 Vessel sherds from palm-funnels with carination from Ribe. – (Drawings L. Lund Feveile).

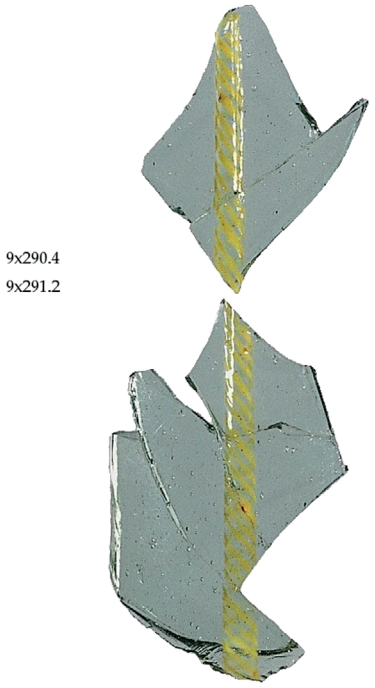

Fig. 8 Vessel sherds from funnel beaker with vertical reticella from Ribe. – (Photos Sydvestjyske Museer).

Glass types

What is meant by »glass types« is the combination of the shape of a glass vessel and the decoration. Here only seven will be presented: Palm-funnels with carination, funnel beakers with vertical reticella, bowls with reticella, palm-funnels with arcades, funnel beakers with incalmo rims, beakers with gold foil and squat jars.

In my former work eleven different glass types have been separated and described, and an attempt is made to place them in a European context (fig. 6)[12].

In the Ribe material there are at least 15 fragments that are linked to palm-funnels with carination. The shape is an ordinary funnel beaker, but in the middle of the beaker there is a ridge or bulge pushed out from the inside. All the sherds discussed here have this characteristic bulge. The material shows that the bulge or ridge is very haphazard in its form; it can be open and rather flat or it can have a sharp angle (fig. 7).

The quality of the glass is generally very pure with only a few small air bubbles. In the rim-sherd material there is a quantity of completely clear and very thin rims that can best be linked with these beakers. All the rims are slightly thickened, primarily rim shape e. Funnel beakers with ridges are a glass type that is known from the whole of the Frisian and Scandinavian area. It is known from finds in Holland where there are several whole examples, e. g. from Dorestad. In the Dutch finds they were dated to the 8th-9th century[13]. The palm-funnels with carination from Ribe, on the other hand, date from the 8th century.

At least nine sherds from the excavation at Posthuset can be related to Funnel beakers with vertical reticella rods (fig. 8). Similar funnel beakers are found represented at Helgö, Dorestad, Southampton and Kaupang[14]. As a type the funnel beaker with vertical reticella rods must be considered as a not uncommon glass vessel type in the 8th-9th century.

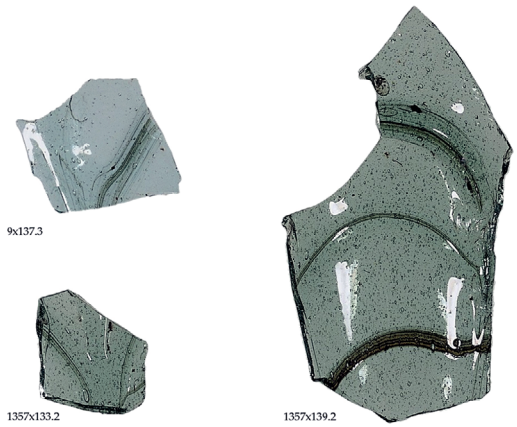

Fig. 9 Vessel sherds from palm-funnel with arcades from Ribe. – (Photos Sydvestjyske Museer).

On the basis of the number of sherds of glass vessels the palm-funnels with arcades are the most frequent type of funnel beaker decoration. In the sherd material there are both funnel beakers/palm-funnels with double and triple arcades (**fig. 9**). Often colour traces can be seen in the glass that seems to support the arcade decoration on the vessel. From other excavations in Ribe similarly fine examples are known[15]. The type is found in Ribe in phases C, D and E, i. e. up to the last quarter of the 8th century. Perhaps the arcade decoration in the Ribe material should be associated with the palm-funnels rather than with the fully developed funnel beakers. From Helgö and from Holland there are finds of several vessels of this type[16]. As mentioned earlier the two funnel beakers from the Birka graves with a decoration that seems similar to the arcades on the 8th century palm-funnels are different[17]. The fully developed funnel beakers from Birka that were found in the graves are dated to the 9th-10th centuries.

There are rims from two different funnel beakers with incalmo rims. One of them (x505.1; **fig. 3**, rim variant g) has a very oblique profile and must belong to a fully developed funnel beaker with a long thin shape which are also known from the boat-grave in Hedeby or Birka grave 526[18]. Incalmo rims are considered to be a late feature in the development of the funnel beakers. This accords well with their frequency in the Birka graves and their placing in the late phases of the marketplace in Ribe. The two rim-sherds were found in phases G and H/I. The origin of the type has to be assumed to be western European, i. e. Frankish.

Among the sherds of glass vessels from the material at Posthuset there are pieces of at least nine bowls with reticella rods and trails (**fig. 4**). The very broad outward-turned rims with yellow thread are linked to these reticella bowls (**fig. 3**, rim variant f). Two of the rim-sherds seem to be completely identical to the rim of the bowl from the Valsgärde 6 grave. Similar sherds from bowls are also known from Borg[19].

As already mentioned, there are fragments of two glass vessels with gold foil decoration in the material. Unfortunately they are both too small to enable anything to be said about the shape of the vessel (**fig. 5**). Similar sherds are known from Uppåkra, Helgö, Dorestad, Valsgärde and Borg, and they are all considered to be connected to a beaker with conical sides and a very small rim diameter, possibly a small funnel beaker. On the basis of the 23 sherds from Borg, Holand has reconstructed a palm-funnel-like vessel (**fig. 10**). There are thus more than 50 known sherds of vessels with gold foil decoration. All were found at sites with abundant find-material. No actual place of production can be identified, but a western European origin, i. e. Rhineland, cannot be ruled out. At present time there is general agreement that sherds of glass vessels with gold foil can be dated to the 8th century[20]. In Ribe the two sherds came respectively from phases E and F, i. e. the last quarter of the 8th century.

In the material there are at least three sherds from different vessels that can be linked to the type squat jars with reticella rods and incalmo rim. Two sherds are from incalmo rims, and they are connected with this type purely on the grounds of their similarity to the known whole beakers from Sweden and Norway. In addition, one of them (x69.1; **fig. 3**, rim variant g) has a very small rim diameter that can hardly come from a funnel beaker. It could also be a little spherical beaker such as is known from grave 644 at Birka[21]. The third sherd (x178.1) has a dark colour, almost black, with yellow reticella rods. The sherd has a bend in it that can only be explained as the curve of a neck. The vessel has had a decoration of horizontal reticella strands at this transition, and around the middle there have been oblique or vertical reticella rods. The long-necked vessel

is considered to be a late type that continues into the 10th century[22]. In Ribe, the sherds were from the latest layer of phases G and H/I, i. e. the first half of the 9th century.

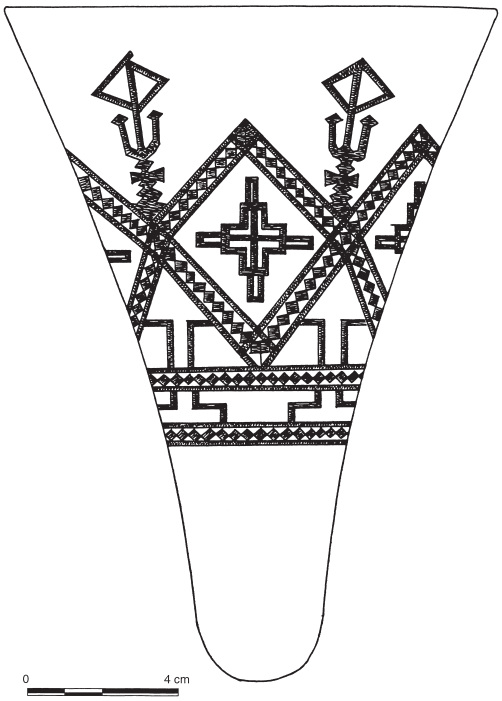

Fig. 10 Reconstructed vessel with geometric gold-foil from Borg. – (After Henderson/Holand 1992, 48 fig. 6).

Summary of primary material from ASR 9 Posthuset

The glass-vessel material from the excavation at Posthuset is extensive and at first sight uniform. Closer examination shows, however, that it includes many types of decorative forms and variations in the colours of both the body of the glass and the decorative elements within the individual vessel types. Mention should in particular be made of the large range of variation within the reticella decoration alone, with hardly two strands being the same. The glass throughout the material is very uniform and almost free of impure elements such as small stones, discolouring, etc., but it always contains a greater or larger number of air-bubbles. This uniformity can also be seen in the thickness of the sherds, which are generally fine and thin throughout the period. There are apparently only a few shapes of glass vessels – probably only four-five different shapes. The variety is predominantly in the decoration. In general, these artefacts are achievements demonstrating an exceptionally skilled level of craftsmanship.

It is remarkable that there are not many sherds that can be related to earlier glass types, such as claw- or cone beakers, as known for instance from nearby Dankirke[23]. There is apparently no overlap between the glass-vessel layer-sequences of the two sites, and there is also a large jump from the 6th to the 8th century. The only common feature are the palm-cups, which are found in both places – at Ribe marketplace with the terminal layers that contain this type of vessel.

The sherds of glass vessels from Posthuset have to be said to be almost »pure« 8th-9th century material. In the earliest phases, B to E, there is the widest range of variation in the glass-vessel material, both in decoration and in vessel form, and it is also here that there apparently was the highest level of activity, the largest amount of imported glassware and sherds. The palm-cups exist on the marketplace in that period, but they disappear later in the 8th century. The funnel beaker is the dominant form and is known with various types of decoration from phase B to H/I. This picture emphasizes how difficult it is to differentiate between the palm-funnel and the fully developed funnel beaker in the sherd material. There are no doubt more palm-funnels in the earlier phases (highlighted by the garland decoration) and there are more fully-developed funnel beakers in the later phases. It is not possible to show a chronological development towards a larger rim diameter in this material with the investigations so far undertaken; the material is too fragmented for that. There is, however, as mentioned before, what seems to be a preferred standard measure.

If a chronological development is to be traced in the glass material it must be in the evolution of the rim-sherds that the evidence is most clearly visible. There is a clear tendency in the rim development: the thick rims are linked to the earliest phases and the only faintly thickened ones are related to the latest phases.

Reticella sherds and funnel beakers with garland decoration and optical blown sherds occur frequently in the earliest phases. Palm-funnels with carination begin earnest after phase B. Clearly later features are the incalmo rims and sherds of squat jars. The coloured incalmo rims have to be said to be a completely new element in the glass-vessel types. They lead towards and into the 9th century. Phases F to I contain a rather smaller quantity of glass-vessel sherds. This distinct decline can also be seen in find-groups such as tesserae, and in glass waste and glass half-fabricate. The decline in glass-vessel sherds is not quite so noticeable. The glass vessels in Ribe come from West European sources – either the same one or several different ones. There are no sherds that can immediately be linked to any eastern connection, and the sherd material is very uniform, as has already been observed. The Frankish-Rhineland connection can clearly be seen in other find-groups, e. g. imported pottery and Rhineland basalt. The English connection is more difficult to trace in the other find-groups, but a few sherds of English shelly ware pottery were found in phase I. The majority of the glass-vessel sherds from Ribe are assumed to come from imported glass from the Frankish/Carolingian, rather than the Anglo-Saxon area, since the palm-funnel/funnel beaker is dominant and has to be thought to come from the Frankish/Carolingian areas.

TRADE WITH GLASS VESSELS AND SHERDS OF GLASS VESSELS

What do the many glass-vessel sherds in Ribe represent? Are they evidence of trade with glass vessels or are they raw material for the bead-makers? The answer is probably a combination of both.

First it must be stated that today there is no doubt that the glass vessels were produced outside Scandinavia and must therefore be seen as imported goods, no matter in what form they arrived [24]. There are no known Scandinavian finds of glass workshops or furnaces from the 8th-9th century. This could of course be because one has not dug in the right places or been lucky with finds. Securely documented domestic production of glass vessels exists in Denmark only from the 16th century and onwards. The raw materials for glass production are to be found in the Nordic region and if production did not begin earlier this may be because the technology behind the making of glass vessels was not known, or it could of course also be a deliberate choice not to embark on local production. It is possible that access to knowledge of the technology was difficult, or even completely blocked – a phenomenon that was not unknown up through the Middle Ages where glass technology was concerned.

The sherds of glass vessels were an element in long-distance trade in the 8th-9th century. Importing glass vessels from European sources was no novelty, since there had been a large influx of glass vessels in the form of exchanges of gifts in the early and late Roman Iron Age, as was reflected particularly in the grave finds. However, actual importing for trade purposes arose gradually throughout the late Roman Iron Age (4th century) [25].

With the exception of the beaker in Birka grave 542 [26], all the glass-vessel types described have a West European-Anglo-Saxon distribution area, and this is evident when one looks at the distribution maps for four types: glass vessels with reticella decoration, funnel beakers in general, palm-funnels with carination and vessels with gold foil decoration. Palm-funnels with carination and gold foil decorated beakers were still rare (**fig. 11**). Both types occur, however, in places where glassware with reticella and other funnel beaker types are already present. Reticella-decorated glass vessels are the type of glassware that has been the focus of most attention, and this perhaps explains the large number of finds and the broad distribution. If one looks at sherd material such as that from ASR 9 Posthuset, it is far from being the most frequent type of glassware. Funnel beakers are the quantitatively dominant form, and it is perhaps surprising that a distribution map for this type was not made until a very late point [27].

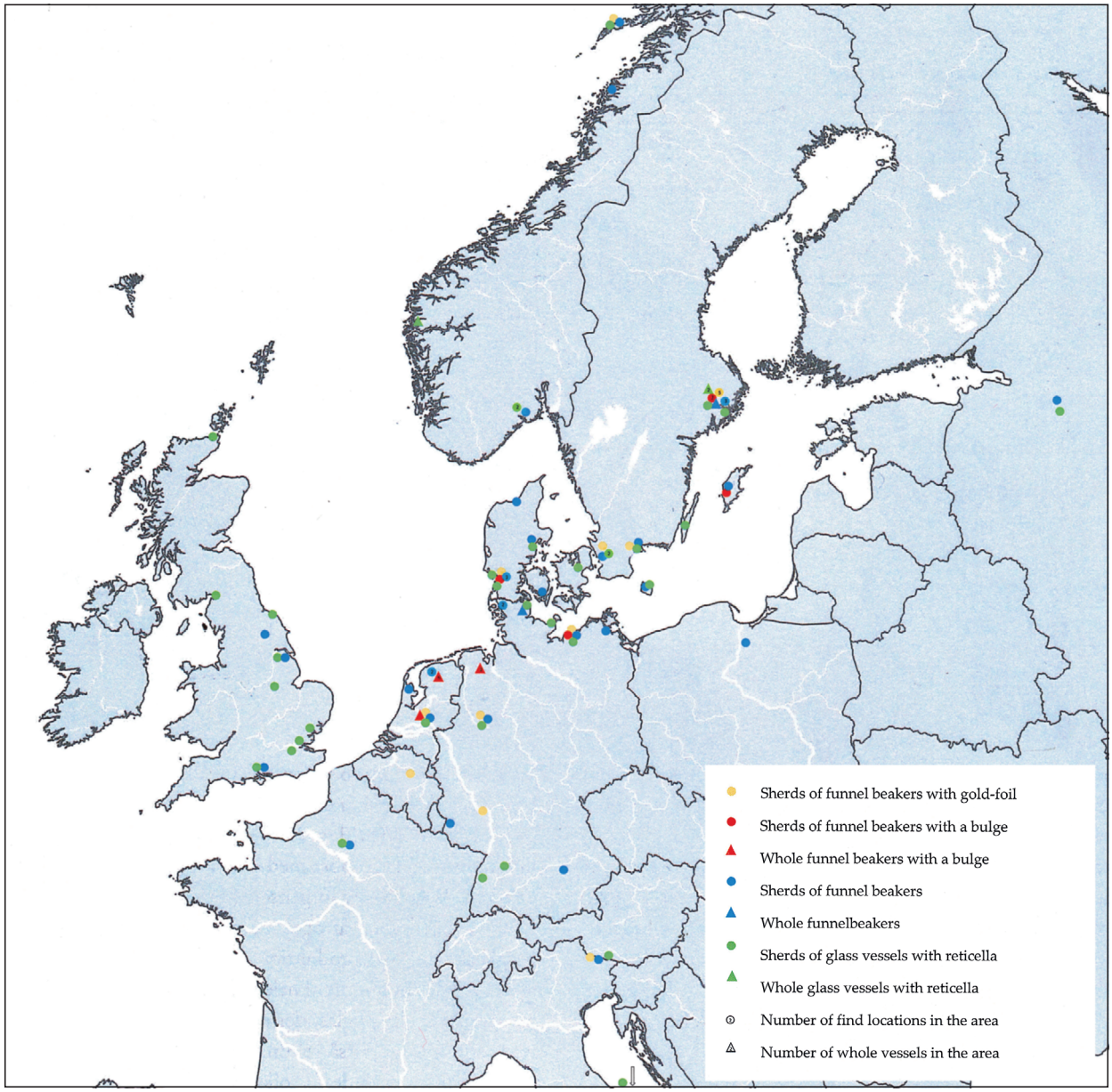

Fig. 11 Occurrence of funnel beakers, palm-funnels with carination, reticella-decorated sherds and vessels and glass vessels with geometric gold-foil. – (After Lund Feveile 2006, 267 f. appendix 2).

This distribution map shows the area in which trade took place with glass vessels/sherds as stretching from the Seine in the south through present-day Belgium and Holland, southeast England, northwest Germany, Denmark with the emphasis on Jutland, the Swedish east coast up to the Mälar region and up to Kaupang in the Oslo fjord. The area centres on the English Channel with the estuaries of the major European rivers, the eastern North Sea and the western part of the Baltic. Because of the lack of finds of glass vessels from the eastern Baltic trading places, it is exceedingly difficult to say anything about how far this trade with Frankish glassware penetrated into the Baltic. Sherds of glass vessels have been found, however, in Menzlin, Groß Strömkendorf, Staraja Ladoga and Novgorod[28]. In Wolin there was glass-bead production, and phrases such as »probably imported raw materials« and »glass production with addition of western glass« possibly conceal the fact that there are sherds of glass vessels of Frankish origin also to be found in this material[29].

Geographically and on the evidence of the finds all the indications are that the glass sherds in Ribe mainly came from the Frankish Rhine area via Dorestad and the Frisian coast. There is a great similarity in the glass sherd material from both trading places, and each also experienced its heyday at the same time. A heavy ware such as Rhineland basalt from the Mayen area, and pottery from the Rhine area highlight these trade connections. Tating pottery has a distribution area corresponding closely in the Nordic region to the distribution of glass vessels and vessel-sherds.

There is a general agreement about the significance of the Frisian merchants in the trade from the Rhineland to Southern Scandinavia[30]. Frankish sources provide the information that trading places such as Dorestad and the smaller Medenblik paid duty on trade to the king. There was thus firm control over Frisian trade and this supports the possibility that they were able to control trade in general, including which trade routes could be used for goods being transported to Scandinavia[31].

The trading place of Southampton has a sherd material that is very similar to Ribe's. West Frankish glass vessels may have arrived there via the estuaries of the Rivers Seine, Somme or Canche. Before the 7th century England is considered not to have had trade of any significance via the Rhine[32], but the West Frankish region was a different matter, and one can imagine that even if the former route became established after the 7th century the older trade routes would also still have been maintained.

In spite of the distances in the area mentioned, the glass vessel types and the composition of the sherd materials at the individual trading places are very similar. Wherever glass vessels and sherds of vessels are found in Scandinavia they come from the same production areas. Imports of pottery, on the other hand, vary in different places. Ribe mainly imported Frankish pottery, whereas in Åhus there are major imports of Slavic/Baltic pottery. There is nothing strange in this find-composition, in geographical terms, but it highlights the particular status that glass vessels and vessel-sherds and the import of them must have had. It seems to have been only one place to obtain them – the West European region. One can therefore well imagine that there would have been some rather fixed trade-routes and connections between suppliers and recipients.

Since it is now established that glass is an import material produced outside Scandinavia elsewhere in Europe it is a natural step to examine the form in which it came to trading places such as Ribe. A distinction has to be made between glass vessels and sherds of glass vessels, i. e. scrap material. Glass vessels can be reduced to sherds in several ways in the course of the »lifetime« of a glass, and in consequence the scrap material can be divided into three types (**fig. 12**).

Primary waste: consists of waste from the production of glass vessels, for instance flat pieces with a little edge – trimmings from the glass production, and defective or unsuccessful glass vessels.

Secondary waste: consists of sherds of glass vessels damaged while being transported, so that they have never reached the end-user. These are sherds of glass vessels that show no sign of defects arising in the production or of wear from use.

Tertiary waste: consists of glass sherds from vessels that have been used for a period by an end-user. When the glass broke the sherds would have a certain value and would therefore have been collected locally. The sherds would have no sign of production-defects, but might to some extent show signs of wear, e. g. on the standing-surface in the form of scratches etc.

It is clear that primary waste must originally come from a production-place for glass vessels, even though it could be traded via several intermediaries. It is more difficult in the case of secondary and tertiary waste, since there are several possibilities as to how it could reach a marketplace such as Ribe. The sherds might be collected in the Central European region and traded from there to the marketplace as part of the bead-maker's raw material. It could also be the case that whole glass vessels were traded to Ribe/Scandinavia and that the secondary and tertiary waste is the result of Danish/Scandinavian collection. Finally, it cannot

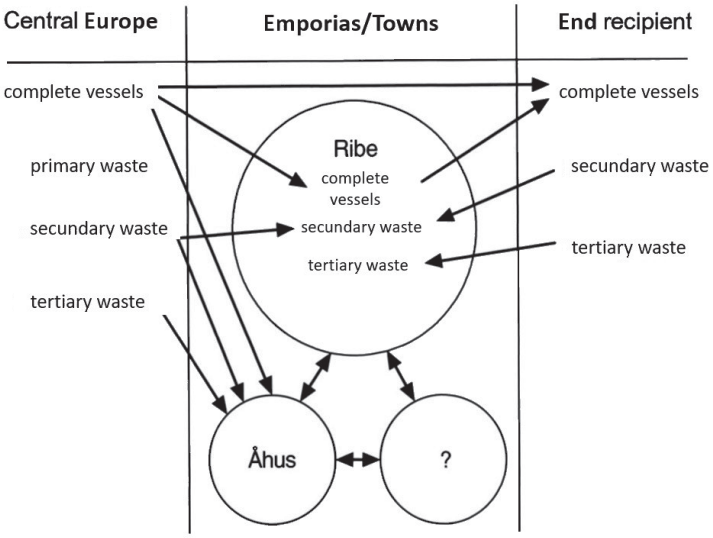

Fig. 12 Simplified model of trade routes with glass vessels and sherds of glass vessels. – (Diagram L. Lund Feveile).

be excluded that glass vessels were traded to places other than Ribe but at later stage found their way there as tertiary waste. Lastly it should also be mentioned that very many sherds cannot be classified as secondary or tertiary waste for the simple reason that large parts of the surface of a vessel would not carry traces of use of the glass. The distinction is nevertheless upheld because in fact the identification of tertiary waste is important, since it cannot come from new glass. These sherds thus represent used vessels, whether this use took place in Middle Europe or in Scandinavia.

Where glass vessels in Scandinavia, dated to the 9th-10th centuries, are concerned, the discussion is virtually hypothetical – the glass vessels found in graves from that period show that whole glass vessels were in fact imported and the same is also true of the centuries before the 8th century. Even though it cannot be proven that the contemporary waste was collected »locally«, it is evident that this is a possibility. But the 8th century poses a problem, since there are no finds of whole glass vessels from the graves in Scandinavia, and nor are there from settlement finds, apart from a handful of sites. By far the greater part of the sherd-material in Scandinavia from that century is found in fact at large marketplaces where there is also bead-production. It cannot be excluded, therefore, that the majority of the sherds arrived at these sites where there is an abundance of sherd-material as a sackful of secondary and tertiary waste imported from another region where glass vessels were used, e. g. in Middle Europe.

As mentioned earlier, the absence of glass vessels in the graves in the 8th century may be the result of changed burial customs and cannot in itself be used as an argument that there were no glass vessels in Scandinavia. The import process therefore has to be traced through scattered and scarce random finds at »end-user« locations, bearing in mind that one has to imagine that most of the sherds would have been collected and redistributed to glass-bead-making marketplaces.

Among researchers who have discussed waste/non-waste there are only very few who have defined what they mean by waste-import, and the discussion has drifted back and forwards through the years[33].

Most recently, T. Sode discussed waste/non-waste in detail and reached the conclusion that a large quantity of the glass-vessel sherds has to be designated as secondary and tertiary waste[34]. The areas/marketplaces where the travelling bead-makers came to work would have been able to a great extent to supply the bead-makers with glass-vessel sherds. This explanation thus rests on the assumption that there must also have been a significant scale of importation of glass vessels, or otherwise the sherds could not have been collected for re-use as part of the bead-makers' raw material.

There is nothing in the material from the excavation at Posthuset that suggests an import of primary waste from production places in Europe. Several glass-vessel sherds in the Ribe material are clearly tertiary waste, with signs of wear on the surface showing that the glass had a long life before it was broken. In the layers and phases where glass-vessel sherds are abundant there are also plentiful finds of other types of glass, in the form of tesserae and blue raw glass. During the excavation at Posthuset in Ribe no less than 2204 tesserae and tesserae stumps were found, and 1500-2000 pieces of blue raw glass. It is thus not the case that vessel sherds occur in significant quantities in places where tesserae and glass splinters do not occur.

It is not surprising that primary waste cannot be identified in the material from Ribe. Would it not be the case that that type of waste would be largely re-used in the glass workshop for new vessels? This was a commonly known form of waste-trade in the Byzantine Empire, where the waste was used for production of glass vessels and not for beads[35].

Sherds of glass vessels from ASR 9 Posthuset, on the other hand, have more features that suggest that they are present as secondary or tertiary waste in association with the bead-maker. There was extensive bead-production at the marketplace where this waste could be used. There are parallels, particularly in phases C, D and E, between the amounts of glass-vessel sherds, tesserae, glass-bead waste and raw glass, and it is thus primarily in these phases that glass beads were produced. From phase F and onwards the quantity of tesserae, raw glass and glass-bead waste declines distinctly, and at the same time imported beads are introduced in large amounts[36]. The number of glass-vessel sherds does not fall so much. This find-picture can be interpreted as showing that through the whole period, in parallel with the flow of secondary and tertiary waste for use in the bead-maker workshops, there was importation of whole glass vessels (with secondary waste as a consequence). After drastic reduction of the local glass bead production the »remaining quantity« of glass-vessel sherds can reflect the continued importing of glass vessels.

The large quantities of sherds that cannot be pieced together seem strange, however, if this is considered to be largely secondary waste weeded out from a load of glass vessels arriving at the marketplace. It is more realistic to interpret the find-picture as a sackful of sherds of different origins brought to the glass-bead maker, i. e. as tertiary waste. But whether it is a Danish/Scandinavian collection, and thus comes from whole glass vessels imported to the area, or whether these are glass sherds collected elsewhere in Europe and then traded to Ribe cannot be definitively established. It seems to be the case, at all the trading places where glass-vessel sherds occur, that each glass vessel is only represented by a few sherds. The explanation for this is too complicated to be solved by simply imagining the importation of a sackful of waste. Aspects such as preservation, depositing of waste and re-use make a clear interpretation difficult.

It is also important to take into account that glass-vessel sherds at sites such as Borg on Lofoten[37] and the marketplace at Ribe cannot directly be compared, since the functions of the two locations are completely different and vessel sherds therefore occur with different evidential value.

The very large quantities of sherds of glass vessels at the marketplace in Ribe in the 8th-9th centuries should thus be seen as the result of secondary and tertiary waste, from one place or another, closely linked to the bead-makers' activities. I am convinced, however, that at the same time and through the whole of the 8th century glass vessels were imported to the Nordic region and used there, even though they have not been found as grave-goods. The scale of this import-trade cannot be determined, but the traces of it can be seen in the glass-vessel sherds at Posthuset at least from phase F and onwards, and in that case they cannot all be ascribed to the bead-maker. The reason for the large quantities of sherds of glass vessels over large parts of the 8th century lies with the craft of bead-making, however, because the craft's use of waste had the effect that marketplaces such as Ribe and Åhus accumulated large quantities of secondary and tertiary waste, in which the »traces« of imports of actual glass vessels to the Nordic region lay concealed. From what areas the secondary and tertiary waste was transported cannot be determined.

																
Phase	Palm-cup with ribs under the bottom	Palm-funnels with arcades	Palm-funnels with carination	Funnel beaker with vertical reticella	Reticella bowls, type A, B and C	Squat jar with reticella	Glass-vessel with gold foil	Funnel beaker with incalmo-rim	Squat jars with incalmo and reticella	Rim variants						
										a	b	c	d	e	f	g
No phase		3	4	2	1					1	1		17	23		
H/I				1				1	1			1		7	1	2
G			1		1				1				2	1		1
F		1	2				1						1	3		
E		10	1		1		1			1	2	6	12	19	1	
D		12	3		2	1				3	1	2	12	17	1	
C		23	3	8	3					6	9	4	26	17	1	
B	1	2	1							7	3		4			
A																
AA																
Total	1	51	15	11	8	1	2	1	2	18	16	13	74	87	4	3

Tab. 6 Number of identified sherds (ASR 9 Posthuset), divided into types of glass vessel and rim variants. – The material can be divided into two layer sequences. – AD 705-790: Phases **B**, **C**, **D** and **E** Rim variants **a**, **b**, **c**, and partly **d**. Rim **f** – only in small numbers. – Vessel types: palm-cups, palm-funnels with arcades, funnel beakers and the majority of sherds with reticella decoration in yellow. – AD 790-850: Phases **F**, **G** and **H / I** – Rim variants **d**, **e**, **f**, and **g**. Rim **e** is the dominant type. – Vessel types: glass vessels with gold-foil, funnel beakers with reticella rods in white, funnel beakers with vertical applied trails in white, funnel beakers with incalmo rims, squat jars with incalmo rim. – (Table L. Lund Feveile).

CONCLUSION

Reviewing the very fragmentary sherds of glass vessels from the excavation at Posthuset in Ribe provides a clear picture of the variations in glass vessels in the period c. 705 to 850. A number of types of glass vessel and rim variations from the marketplace could be identified divided into two layer sequences – an earlier one (phases B-E) and a later one (F-H/I) (**tab. 6**). The types correspond to those known from the rest of Scandinavia and Northwest Europe, and the similarities have been made more visible. This is highlighted by three types: the funnel beaker with a bulge, the funnel beaker with reticella rods, and glass vessels with gold foil decoration, since close examination shows that they can be found at almost all trading-places.

The earlier layer sequence contains a few elements of early glass vessel types such as claw/Snartmo beakers, palm-cups, funnel beakers/palm-funnels with garland decoration, and the majority of reticella-decorated glass vessels, including all funnel beakers with reticella rods with yellow decoration trails. The rim types a, b, c, and partly d are also associated with this layer sequence. Rim type f is only found in small numbers, but it is probable that that rim type should also be associated with the earlier layer sequence since it is closely linked to bowls with reticella decoration.

The later layer sequence contains glass vessels with gold foil decoration, funnel beakers with reticella rods with white decoration trails, funnel beakers with white vertically applied trails, funnel beakers with incalmo rims and long-necked beakers with incalmo rims and reticella rods. The rim types d, e and g belong to this layer sequence, with e as the clearly dominant type.

It can be concluded that the development of the forms of glass vessels in the 8th century was not radical or in any way revolutionary. There were few forms, almost all of them unstable glass vessel shapes, i. e. glass that could not stand upright on a base. There are no clear innovations; on the contrary, the development from palm-cups to palm-funnels to funnel beakers is characterised by a steady and continuous evolution.

If one looks more closely at the glass-vessel types within the different vessel forms, however, there is great variation, and a clear change can also be seen in the rim types during the period. The funnel beaker in particular is treated with all forms of decoration. A development can be traced within the decorative elements, most clearly in the garland decoration. From being the second most frequent decorative form in the earlier layer sequence it disappears in the last quarter of the 8th century. This shows that garland decoration is linked to the palm-funnel rather than to the fully developed funnel beaker. The reticella decoration is of a high level of craftsmanship – the trails are fine and regular.

Incalmo rims are found only in the latest phases, G-H/I, i. e. from around 800. This is a revolutionary technique, since all rims previously had been part of the glass vessel itself, whereas the incalmo rim is added. Decoration with white applied threads and reticella rods with white decoration trails appears to be a similarly late feature. The reticella decoration becomes coarse and has a tendency to blur, while at the same time the quantity of reticella-decorated sherds seems to decline.

This review of the sherd material at Ribe ASR 9 Posthuset has also made it clear that a fragmentary material can certainly be used to extract conclusions concerning the development of shapes and chronology, so long as it has a certain scale and there are sound excavation techniques combined with favourable stratigraphic conditions.

It is my hope that the Ribe material, with its unusually fine-meshed relative and absolute chronology, will make it possible to identify sherds of glass vessels from the 8th-9th centuries in contexts where the excavation conditions and stratigraphic relationships in themselves do not permit dating of the finds.

Notes

1) Arbman 1937.
2) Arbman 1940.
3) Callmer 1990. – Stjernquist 1999. – Henderson/Holand 1992. – Holand 2003. – Skre/Pilø/Pedersen 2002. – Pöche 2005. – Isings 1980. – Sablerolle 1999. – Hunter 1980.
4) Lund 1993.
5) Feveile/Jensen 2000. – Feveile 2006.
6) Baumgartner/Krueger 1988, 68.
7) Examples see Lund Hansen 1987, fig. 39. 54. 63.
8) Baumgartner/Krueger 1988, 70.
9) Näsman 1984b, 80. – Fingerlin/Garbsch/Werner 1969, fig. 13, 10-11.
10) Arbman 1940, pl. 189-1 grave 577; pl. 190-2 grave 551.
11) von Pfeffer 1953, 154.
12) Lund Feveile 2006, 249-251.
13) Baumgartner/Krueger 1988, 62 fig. 3. – Sablerolles 1994, 99 fig. 2; 1999.
14) Holmqvist/Arrhenius 1964, 253 fig. 115. – Isings 1980, 232 fig. 154.2. – Baumgartner/Krueger 1988, 74-75 fig. 19-21. – Skre 2001, personal com.
15) Feveile 2006, Bd. 1.2, pl. 6-7.
16) Ypey 1964, fig. 39-40. – Besteman 1990, 109.
17) Arbman 1940, pl. 189-1 grave 577; pl. 190-2 grave 551.
18) Baumgartner/Krueger 1988, 61.
19) Roesdahl 1992, fig. 154e.
20) Lundström 1971, 53. – Baumgartner/Krueger 1998, 66-68 fig. 7-10. – Sternquist 1999, 81. – Holand 2003.
21) Arbman 1940, pl. 189-4.
22) Hunter 1980. – Ypey 1964.
23) Lund Hansen 1983.
24) Näsman 1984a, 35. – Ingemark 1995, 241.
25) Lund Hansen 1990, 78.
26) Arbman 1940, pl. 194-1a/b.
27) Näsman 1990, 99 fig. 7.
28) Pöche 2005.
29) Filipowiak 1991, 20. 36.
30) Näsman 1990, 113.
31) Besterman 1990, 109.
32) Näsman 1984b, 89.
33) Arbman 1937. – Holmqvist/Arrhenius 1964, 258. – Lundström 1976, 7; 1981, 19. 97; Bencard 1990, 145. – Callmer 1991, 37. – Jensen 1991, 15.
34) Sode 2002, 119.
35) Sode 1996, 16.
36) Sode/Feveile 2002.
37) Munch 1991.

References

Arbman 1937: H. Arbman, Schweden und das karolingische Reich (Stockholm 1937).

1940: H. Arbman, Birka 1. Die Gräber. Tafeln (Stockholm 1940).

Baumgartner/Krueger 1988: E. Baumgartner / I. Krueger, Phönix aus Sand und Asche. Glas des Mittelalters (München 1987).

Bencard 1990: M. Bencard 1990, The Stratigraphy and Dating of 8th Century Ribe. Journal Danish Arch. 7, 1990, 225-228.

Besteman 1990: J. C. Besteman, North Holland AD 400-1200: turning tide or tide turned? In: J. C. Besteman / J. M. Bos / H. A. Heidinga (eds), Medieval Archaeology in the Netherlands (Maastricht 1990) 91-109.

Callmer 1990: J. Callmer, Vendeltida glasmästare på handelsplatsen i Åhus. Populär Ark. 8/3, 1990, 20-22.

1991: J. Callmer, Platser med anknytning til handel och hantverk i yngre järnälder. Exempel från södra Sverige. In: P. Mortensen / B. M. Rasmussen (eds), Fra Stamme til Stat i Danmark 2. Jysk Arkæologisk Selskabs Skrifter 22.2 (Århus 1991) 29-47.

Feveile 2006: C. Feveile (ed.), Det ældste Ribe. Udgravninger på nordsiden af Ribe Å 1984-2000. Ribe Stud. 1.1-1.2 (Ribe 2006).

Feveile/Jensen 2000: C. Feveile / S. Jensen, Ribe in the 8th and 9th century. A Contribution to the Archaeological Chronology of North Western Europa. Acta Archaeologica 71, 2000, 9-24.

2006: C. Feveile / S. Jensen, ASR 9 Posthuset. In: Feveile 2006, 119-189.

Filipowiak 1991: W. Filipowiak, Wolin – Jomsborg. En Vikingetids-Handelsby i Polen (Roskilde 1991).

Fingerlin/Garbsch/Werner 1969: G. Fingerlin / J. Garbsch / J. Werner, Die Ausgrabungen im langobardischen Kastell Ibligo-Invillino. Vorbericht über die Kampagnen 1962, 1963 und 1965. Germania 46, 1969, 73-110.

Gaut 2007: B. Gaut, Vessel Glass from Kaupang: A Contextual and Social Analysis. Norwegian Arch. Review 40/1, 2007, 26-41.

Henderson/Holand 1992: J. Henderson / I. Holand, The Glass from Borg: an Early Medieval Chieftan's Farm in Northern Norway. Medieval Arch. 36, 1992, 29-58.

Holand 2003: I. Holand, Glass Vessels. In: G. A. Munch / E. Roesdahl / O. S. Johansen (eds), Borg in Lofoten. A Chieftain's farm in North Norway. Ark. Skriftser. 1 (Trondheim 2003) 211-229.

Holmqvist/Arrhenius 1964: W. Holmqvist / B. Arrhenius, Excavations at Helgö 2. Report for 1957-59 (Stockholm 1964).

Hunter 1980: J. Hunter, The Glass. In: P. Holdsworth (ed.), Excavations at Melbourne Street, Southampton, 1971-76. CBA Research Report 33 (Southampton 1980) 59-72.

Ingemark 1995: D. Ingemark, Glasblåsning – ett tidigt hantverk i Skandinavien? Fornvännen 90, 1995, 241-248.

Isings 1980: C. Isings, Glass Finds from Dorestad, Hoogstraat 1. In: W. A. van Es / W. J. H. Verwers (eds): Excavations at Dorestad 1 the Harbour: Hoogstrat 1. ROB Nederlandse Oudheden 9 (Amersfoort 1980) 225-237.

Jensen 1991: S. Jensen, Ribes Vikinger (Ribe 1991).

Lund 1993: L. Lund, Hulglasskår på Markedspladsen Ribe, år 700 til 850. Hulglastyper, deres kronologi, oprindelse, betydning og funktion set på baggrund af materialet fra Ribe [M. A. thesis Univ. Aarhus 1993].

Lund Feveile 2006: L. Lund Feveile, Hulglasskår fra markedspladsen i Ribe, ASR 9 Posthuset. In: Feveile 2006, 195-277.

Lund Hansen 1983: RGA² 5/3-4 (1983) 249-252 s. v. Dankirke §2 Gläser (U. Lund Hansen).

1987: U. Lund Hansen, Römischer Import in Norden. Warenaustausch zwischen dem Römischen und dem freien Germanien. Nordiske Fortidsminder, Ser. B, 10 (København 1987).

1990: U. Lund Hansen, Langdistancehandel i romersk jernalder – fra gaveudveksling til aftalehandel. Hikuin 16, 1990, 63-88.

Lundström 1971: A. Lundström, Cuppa vitrea auro ornata. Antikvariskt Arkiv 40 = Early Medieval Stud. 3, 1971, 52-68.

1976: A. Lundström, Bead Making in Skandinavia in the Early Middle Ages. Antikvariskt arkiv 61 = Early Medieval Stud. 9 (Stockholm 1976).

1981: A. Lundström, Survey of the Glass from Helgö. In: A. Lundström / H. Clarke (eds), Glas, iron, clay. Excavations at Helgö 7 (Stockholm 1981) 1-28.

Munch 1991: G. S. Munch, Høvdinggården »Borg i Lofoten«. Ottar 1991/4, 43-48.

Näsman 1984a: U. Näsman, Glas och handel i senromersk tid och folkvandringstid. En studie kring glas från Eketorp-II, Öland, Sverige. AUN 5 (Uppsala 1984).

1984b: U. Näsman, Vendel Period Glass from Eketorp-II, Öland, Schweden. Acta Arch. (København) 55, 1984 (1986), 55-116.

1990: U. Näsman 1990, Om fjärrhandel i Sydskandinaviens yngre järnålder. Handel med glas under germansk järnålder och vikingetid. Hikuin 16, 1990, 89-119.

von Pfeffer 1953: W. von Pfeffer, Zur typologie merovingerzeitlicher Gläser mit Fadenverzierung. In: H. Klumbach (ed.), Festschrift des Römisch-Germanischen Zentralmuseums in Mainz zur Feier seines hundertjährigen Bestehens 1952, 3 (Mainz 1953) 147-160.

Pöche 2005: A. Pöche, Perlen, Trichtergläser, Tesserae. Spuren des Glashandels und Glashandwerks auf dem frühgeschichtlichen Handelsplatz von Groß Strömkendorf, Landkreis Nordwestmecklenburg. Beitr. Ur- u. Frühgesch. Mecklenburg-Vorpommern 44 = Forsch. Groß Strömkendorf 2 (Schwerin 2005).

Roesdahl 1992: E. Roesdahl (ed.), Viking og Hvidekrist. Norden og Europa 800-1200 (København 1992).

Sablerolles 1994: Y. Sablerolles, De glasvondsten van Wijnaldum (Fr.) Paleo-Aktueel 5, 1994, 97-101.

1999: Y. Sablerolles, The glass vessel finds. In: J. C. Besteman / J. M. Bos / D. A. Gerrets / H. A. Heidinga / J. de Konong (eds), The Excavations at Wijnaldum. Reports on Frisia in Roman and Medieval Times 1 (Rotterdam 1999) 229-252.

Skre/Pilø/Pedersen 2002: D. Skre / L. Pilø / U. Pedersen, The Kaupang Excavation Project. Annual Report 2001 (Oslo 2002).

Sode 1996: T. Sode, Anatolske glasperler (København 1996).

2002: T. Sode, Glasskår fra markedspladsen i Ribe – handel med råglas og glasskår. In: J. Pind (ed.), Drik og du vil leve skønt. Festskrift til Ulla Lund Hansen på 60 årsdagen 18. august 2002. PNM. Stud. Arch. & Hist. 7 (København 2002) 113-123.

Sode/Feveile 2002: T. Sode / C. Feveile, Segmenterede metalfolierede glasperler og blæste hule glasperler med metalbelægning fra markedspladsen i Ribe. By, marsk og geest 14, 2002, 5-14.

Stjernquist 1999: B. Stjernquist, Glass from Uppåkra: A Preliminary Study of Finds and Problems. In: B. Hårdh (ed.), Fynden i centrum. Keramik, glas och metall från Uppåkra. Uppåkrastudier 2 = Acta Arch. Lundensia, Ser. in 8°, 30 (Stockholm 1999) 67-94.

Ypey 1964: J. Ypey, Die Funde aus dem frühmittelalterlichen Gräberfeld Huinerveld bei Putten im Museum Nairac in Barneveld. Ber. ROB 12-13, 1962-1963, 99-153.

Zusammenfassung

Die Glasgefäßscherben der Stadt Ribe nehmen innerhalb des nordeuropäischen Glasgefäßmaterials sowohl aufgrund ihrer Menge als auch insbesondere aufgrund der stratigraphischen Verhältnisse in Ribe eine bedeutende Stellung ein. Diese Stratigraphie hat es ermöglicht, eine ungewöhnlich verfeinerte relative und absolute Chronologie für den Zeitraum von ca. 700-900. aufzustellen. 45 Jahre archäologische Ausgrabungen wurden in mehreren Etappen und mit unterschiedlichen Ausgrabungsmethoden in der Stadt Ribe durchgeführt und ergaben Funde von insgesamt ca. 3500 Scherben von Glasgefäßen (Stand März 2018). Es ist der mit Abstand größte Fund von Glasgefäßscherben aus dem 8.-9. Jahrhundert von einem Fundort in ganz Westeuropa.

Basierend auf den Scherben von Glasgefäßen aus der Ausgrabung ASR 9 Posthuset werden in dieser Arbeit die Formen und Typen der in Ribe vorhandenen Glasgefäße identifiziert und eine Chronologie bezüglich ihres Vorkommens erstellt. Innerhalb der Stratigraphie des 8. und 9. Jahrhunderts in Ribe lässt sich die Entwicklung vom Trichtertummler zum voll entwickelten Trichterbecher erkennen. Es lassen sich zwei Schichten von Glasgefäßen unterscheiden, wobei

die Trichtertummler mit Arkaden oder Wulst in der früheren Schicht vorkommen und die vollständig entwickelten Trichterbecher der späteren Schicht angehören.
Die Existenz von Glasscherben in Ribe zeugt sowohl vom Handel mit Glasgefäßen nach Skandinavien als auch vom Handel mit Rohmaterial für die in Ribe tätigen Glasperlenmacher. Das Produktionsgebiet von Glasgefäßen ist noch nicht vollständig dokumentiert, aber ein Ursprung im fränkischen Rheingebiet ist wahrscheinlich. Von hier aus fuhren die Schiffe über Dorestad und die friesische Küste bis nach Ribe. Die Glasgefäßscherben stellen ein sehr homogenes Element im Fernhandel in den Städten des 8.-10. Jahrhunderts dar.

Summary

The glass-vessel sherds from the town of Ribe occupy an important position within North European glass-vessel material, both on the grounds of their quantity, and also, in particular, because of the stratigraphic conditions in Ribe. This stratigraphy has made it possible to establish an unusually refined relative and absolute chronology for the period c. AD 700-900. 45 years of archaeological excavations have been carried out at several stages and with different excavation-methods at the town of Ribe and this has resulted in finds of a total of ca. 3500 sherds of glass vessels (march 2018). The, by far, largest find of glass vessel sherds from the 8th-9th century AD from one location in all western Europe.
On the basis of the glass vessel sherds from the excavation ASR 9 Posthuset this paper presents an identification of which shapes and types of glass vessels are present and establishes a chronology relating to their presence in Ribe. Within the 8th and 9th century layers of Ribe it is possible to identify the development from palm-funnel to fully developed funnelbeaker, to separate two layers of glass vessels with the palm-funnel with arcade and carinations belonging the the earlier layers and the fully developed funnelbeaker belonging to the later layer.
The presence of glass vessel sherds in Ribe are evidence of both trade with glass vessels into Scandinavia and trade with raw material for the glass bead makers working in Ribe. The production area of glass vessels is still not fully documented but an origin in the Frankish Rhine area is probable. From here the vessels traveled via Dorestad and the Frisian coast to Ribe. The glass vessel sherds are representing a very homogenous element in the long-distance trade in the towns of the 8th-10th century AD.