MAREA 2001: WINDOWPANES AND OTHER GLASS FINDS

Renata Kucharczyk

This season yielded a good quantity of glass finds (almost a hundred or so fragments). Unfortunately, no new dating evidence for any particular glass type has been offered in consequence. Most of the glassware may be widely attributed to a period ranging from the 6th to the 8th century AD. Some earlier forms, namely bases with coiled foot ring, usually dated to the 4th-5th century, were also identified.[1] Like most of the Byzantine glass, the finds from Marea are made of very thin bluish-green and greenish fabric. The glass is usually transparent and translucent with numerous small and big bubbles. The recorded fragments are mostly in good condition, but in a few cases the glass has become discolored and the surface badly pitted with heavy peacock iridescence.

One of the commonest group-types encountered in the assemblage are bottles and flasks of various sizes and shapes. The majority of them represent miscellaneous types of small containers for liquids (oil and scents) used in bathing (*Fig. 1:4*).

The funnel-neck bottle, one of the most widespread shapes in the Late Roman-Byzantine period, is a common form (*Fig. 1:1-3*). The collected shards suffice as a guideline for restoring a complete vessel shape. This particular type is well attested not only in nearby Alexandria,[2] but also on many other sites in the Near East.[3] Another group consists of small toilet bottles for perfumes (*Fig. 1:6*), which, contrary to other vessels, are markedly thick.[4] Worth mentioning is the upper part of a bottle with a handle (probably a jug), also serving cosmetic purposes (*Fig. 1:5*).

Of special interest is a bottle base decorated with painted brick-red spots and threads, dated to the 8th century.[5] Several fragments of wine glasses, shallow plates and bowls were also recorded in the assemblage.

Apart from vessels, several fragments of typical 7th-8th century tumbler lamps

1) D. Whitehouse, "The Glass", in: D. Whitehouse et al., The Schola Praeconum II, *PBSR* 53 (1985), 164-171, fig. 5:55-58; G.D. Weinberg, Excavations at Jalame (Columbia 1988), 58-59, with extensive bibliography for other sites.

2) M. Rodziewicz, Les habitations romaines tardives d'Alexandrie, *Alexandrie III*, pl. 73, no. 385.

3) C. Meyer, "Glass from the North Theatre, Byzantine Church and Soundings at Jerash", *BASOR* Suppl. 25 (1987), 207, fig. 10:F-G,M; A. von Saldern, Ancient and Byzantine Glass from Sardis (Cambridge-London 1980), 72-73, no. 478; J.W. Hayes, Excavations at Sarachane in Istanbul, 2: The Pottery (Princeton 1992), 402, fig. 150:13; O. Dussart, Le verre en Jordanie et en Syrie du Sud (Beyrouth 1998), 150, pl. 43:4-5; K. Gawlikowska, "The Collection of Glass Vessels in the Museum of Palmyra", *Studia Palm.* IX (1994), 25 pl. V,5.

4) For similar vessels, cf. C. Meyer, Jerash, op. cit., 197-198, fig. 8:H; D. Barag, "Glass Vessels", *Atiqot* XVI (1983), 37-38, fig. 9:5-6.

5) For parallels from other Egyptian sites, cf. G. Scanlon, Fustat Glass of the Early Islamic Period (London 2001), 65:32h; D. Foy, "Secteur Nord de Tebtynis (Fayyoum), la verrerie byzantine et islamique", *AnIsl* 35 (2001), 471-472, fig. 3.

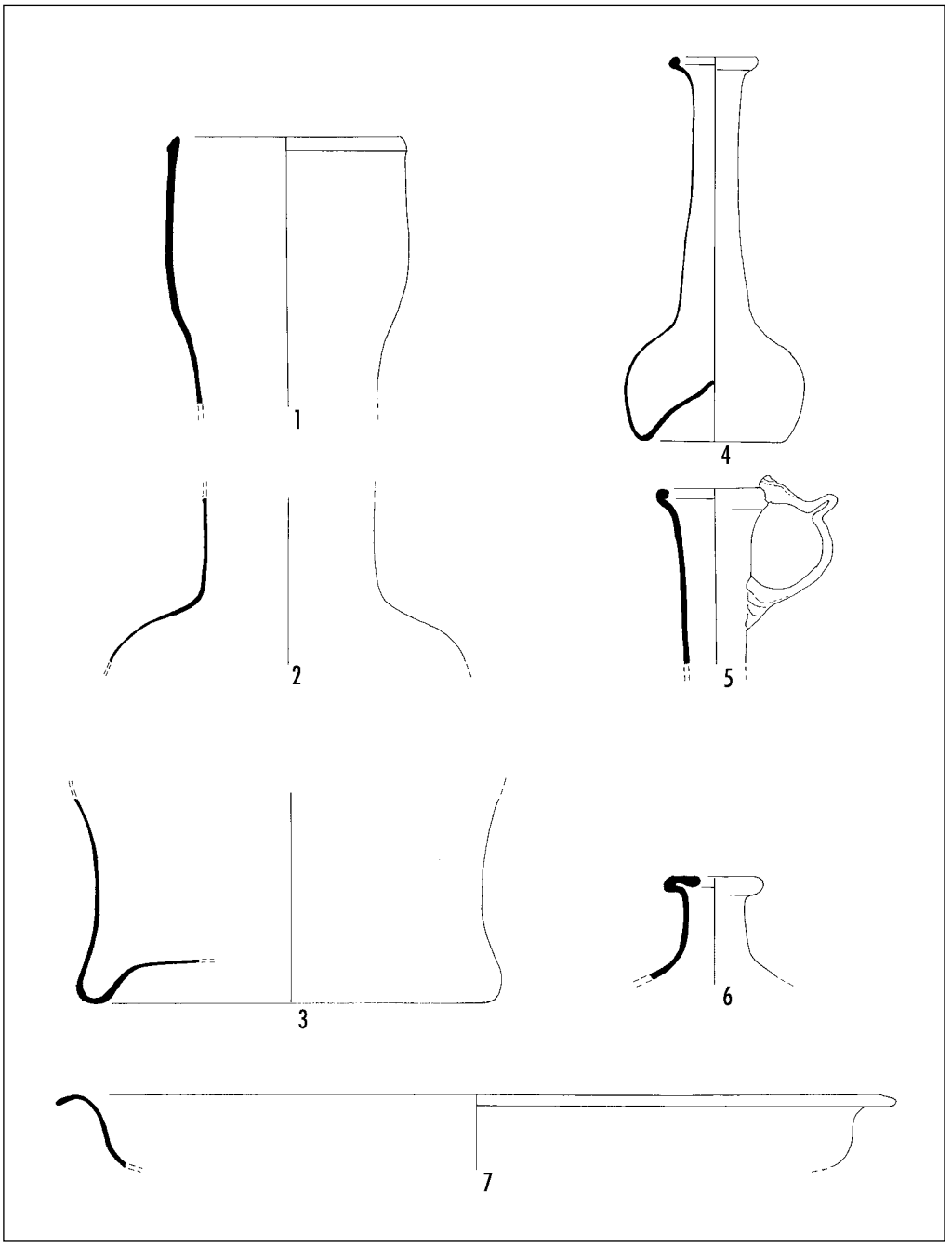

Fig. 1. Glass vessel fragments from the bath at Marea (no. 4: shape restored from two pieces). Scale 1:2 (Drawing R. Kucharczyk)

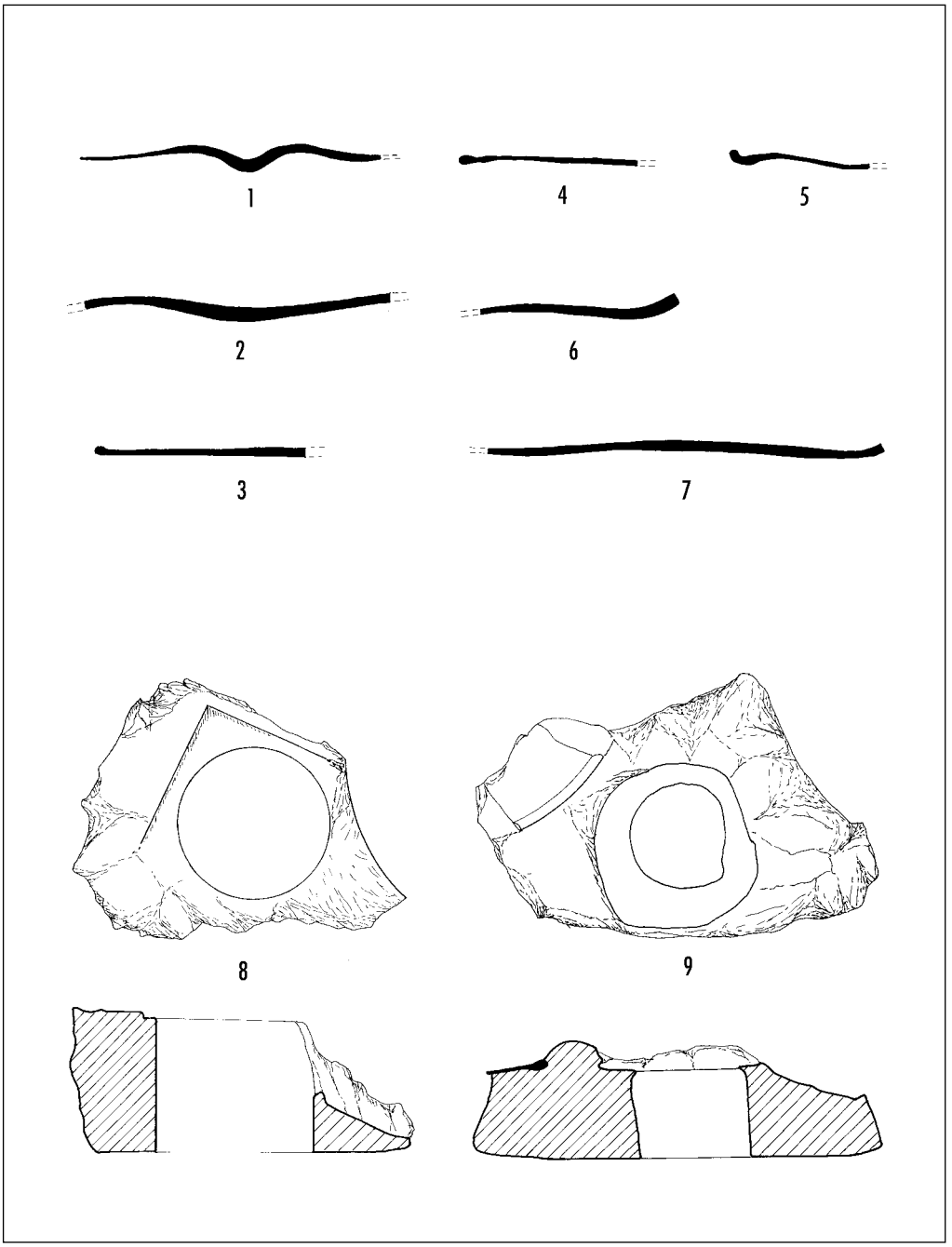

Fig. 2. Glass windowpanes and window openings: Scale 2:1-5 – "bull's-eye" glass; 2:6-7 – "muff" glass; 2:8-9 – fragments of window openings. Scale 1:2 (Drawing 1-7 – R. Kucharczyk; 8-9 – G. Majcherek)

with three handles, as well as lamps with solid knobbed stems were also identified.[6] Given the fact that remains of a glass kiln were identified nearby, and few wasters were observed in the excavated material, there is little doubt that one or more workshops had functioned in the area and that they had supplied a local market.[7] What sets apart the glass material from Marea is the surprisingly large quantity of well preserved windowpanes, some still embedded in the plaster – a rare occurrence in the archaeological record. The assemblage consists of some 90 fragments. The glass is mostly bluish-green, like the majority of the glass finds from Marea, bubbly, the surface often iridescent or black and flaking.

The "crown" method is obviously prevalent as far as windowpane production in Marea is concerned – 80 plus fragments have been recovered. Such panes were

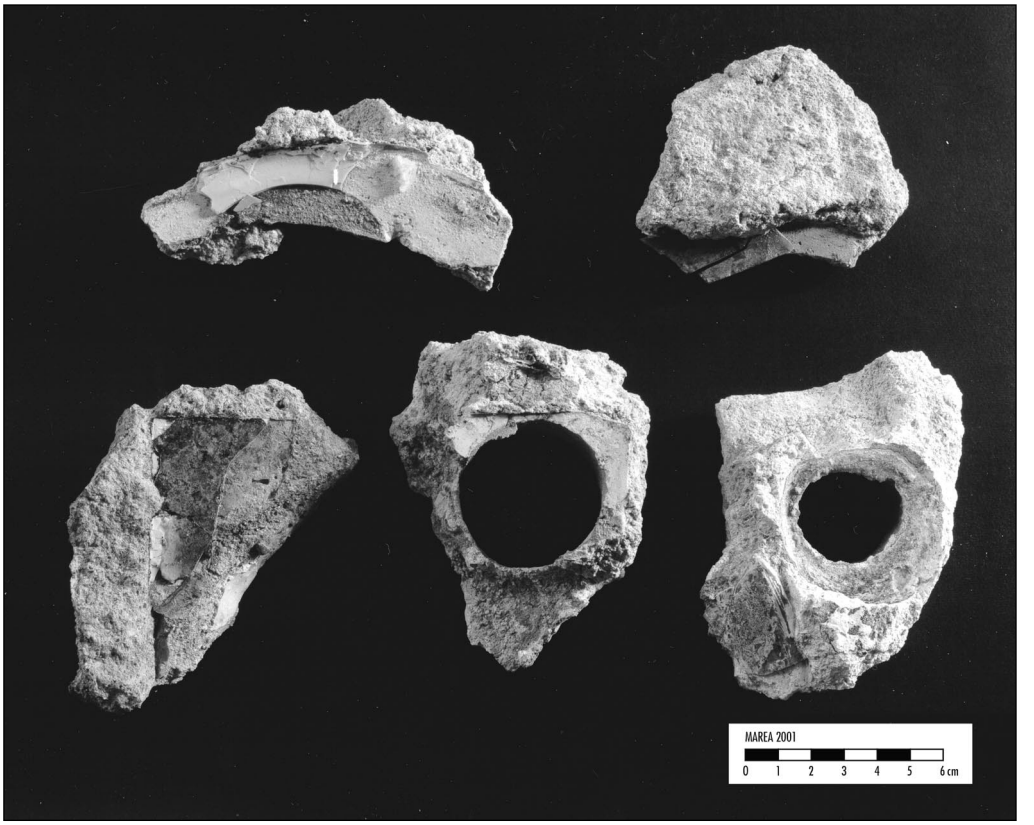

Fig. 3. Fragments of window openings with panes still embedded in the plaster (Photo T. Kalarus)

6) G.M. Crowfoot, D.B. Harden, "Early Byzantine and Later Glass Lamps", *JEA* 17 (1931), 196-208, pls. XVIII-XX; S. Hadad, "Glass lamps from the Byzantine through Mamluk periods at Beth Shean, Israel", *JGS* 40 (1998), 64-69, figs. 1-2.

7) M.-D. Nenna et al., "Ateliers primaires et secondaires en Égypte à l'époque gréco-romaine", in: M.-D. Nenna (ed.), La route du verre, ateliers primaires et secondaires du second millénaire av. J.-C. au Moyen Age (Lyon 2000), 102-104, 110.

round with a thick center, called a "bull's-eye", the thin edges being either folded or rounded. In Marea, none had folded edges, all were rounded and in a few cased exhibited a slight outward-arching tendency (*Fig. 2:1-5*). The usual thickness of the panes varies between 2 and 3 mm; occasionally, examples can be very thin, a mere one millimeter. The diameter of the discs is most likely to be between 16 and 22 cm, albeit a pane as much as 30 cm in diameter has been recorded. Among the round panes there are seven pieces with a thick center (one disk is almost complete), 45 fragments with rounded edges and over 30 without rims preserved.

Traces of lime mortar are present on practically all the pieces. Undoubtedly, the panes were mounted in plaster frames to fill a window opening. In seven cases at least, the panes were found still embedded in the plaster. Surprisingly, if the Marea finds are anything to go by, more than one kind of glass, executed in different techniques – the above-mentioned "crown" and muff techniques – could have been used within the frame of a single window (*Fig. 2:8*). While such a coinciding of different techniques is unusual, at Marea it does not seem to have had any chronological significance. Clearly, the two techniques for manufacturing windowpanes were practiced concurrently.[8)]

The size of the preserved pieces of plaster embedding gives some idea of the windows themselves and of how the panes were arranged. The windows were composed of presumably round openings of varied size, paved either with discs or flat thin panes. Based on the surviving parts of windows, the circular holes may be said to form a geometric pattern: a big circle (perhaps more than one) surrounded by a number of smaller ones. The evidence from Marea is insufficient, however, to permit a reconstruction of the size of the windows as a whole (*Fig. 2:8,9; 3*).

Somewhat more surprising in form are two heart-shaped openings pierced in a thick brick wall; the fragments in question were found near the entrance to a large heated chamber A1 (*Fig. 4*).[9)] Contours of other, incompletely surviving shapes, perhaps more hearts and rectangles, can be seen next to the heart-shaped openings. A round windowpane can be seen embedded in one of the heart-shaped holes – the disc was much bigger than the opening it filled. One should note as an example of an equally unusual shape a fragment of window opening from Nishapur (10th century AD). It was preserved intact and the windowpane was made most likely in the "crown" technique. In this case, the small openings, most probably forming a geometric pattern, permitted more light to reach the interior.[10)]

It seems that these two perfectly preserved openings had constituted, respectively, the outer and inner faces of the same section of wall that had once separated chamber A1 from the *tepidarium* A2. Could this be construed as evidence for other windows in the bath also being paned on two sides?[11)]

8) In some cases plates may have been used as windowpanes, cf. S. Sauneron, "Travaux de l'IFAO en 1973-74", *BIFAO* 74 (1974), 189, 190, pl. XXVIII.

9) For a plan of the bath and a discussion of the excavation results, see report by H. Szymańska and K. Babraj in this volume.

10) J. Kroeger, Nishapur: Glass of the Early Islamic Period (New York 1995), 184-187, no. 237 (H: 12cm, L: 21cm).

11) See windowpanes on two sides in the baths in Bosra: H. Broise, "Vitrages et volets des fenêtres thermales à l'époque impériale", *Coll. École Française de Rome* 42 (1991), 70-75, fig. 30.

Crown glass, according to Harden, was invented in the Near East sometime in the 4th century. From there it spread throughout Italy and to the West.[12] Round window panes in Late Roman-Early Islamic contexts were found on many sites in the Levant,[13] while in the West they have been recorded in Italy[14] and even as far away as Britain.[15]

The four fragments of windowpanes, one still embedded in plaster, from the bath in Marea, recognized as being manufactured in the "muff" or cylinder-blown technique, can be identified as such, even though the glass has turned black and the character of the surface is not quite clear. Two fragments (presumably from the same sheet) preserve the original edges where the cylinder was cut in two. The margin is slightly curved (Fig. 2:6-7). On one piece, however, on the underside, lines may be observed, running all along the piece of glass. These lines can be interpreted as a reflection of the surface of the mould, in which the glass paste had been rolled and stretched until it reached the edges of the mould.[16] Distinguishing between roller-molded and "muff" glass is

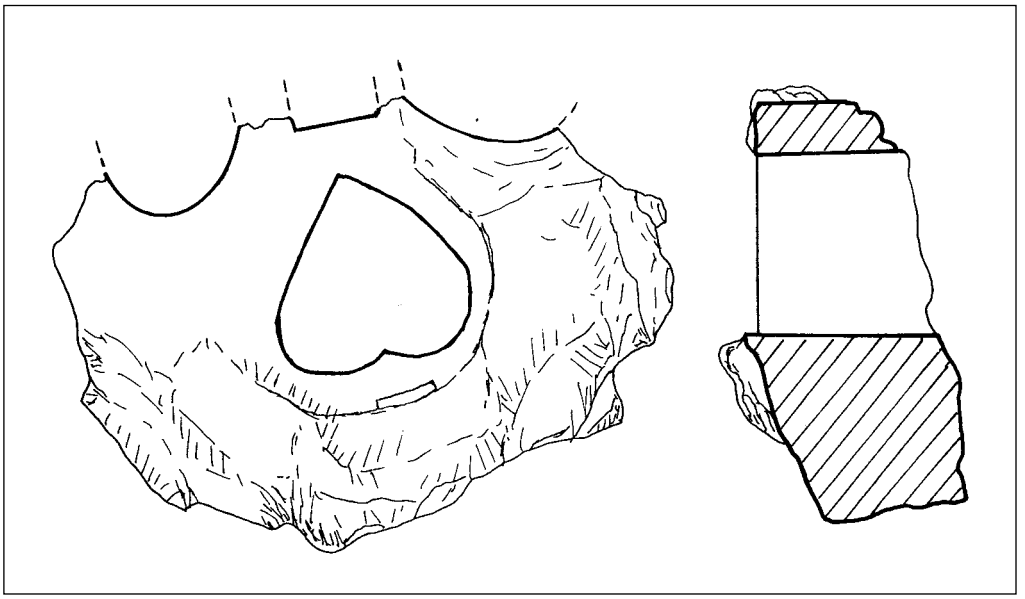

Fig. 4. Wall fragment with window openings. Scale 1:10 (Drawing G. Majcherek)

12) D.B. Harden, "Ancient Glass III: Post Roman", *AJA* 128 (1972), 83.

13) C. Meyer, Jerash, op. cit., 207-211, fig. 10:O-U; Crowfoot, Samaria, op. cit., 420-421; Saldern, Sardis, op. cit., 91-92; Broise, Vitrages, op. cit., 74-75, fig. 32; C.J. Lamm, Das Glas von Samarra, vol. 4 (Berlin 1928), 127-128. Cf. similar finds from Sudan: D.B. Harden, "The Glass found at Soba", in: P.L. Shinnie, Excavations at Soba (Khartum 1955), 60, 64, 67, fig. 37; 34-36, fig. 47.

14) F. dell'Acqua, "Ninth-Century Window Glass from the Monastery of San Vincenzo al Volturno", *JGS* 39 (1997), 36-37, 39, fig. 4; G. Bovini, "Gli antichi vetri da finestra della Chiesa di S.Vitale", *Felix Ravenna*, ser. 3, 91 (1965), 98-108.

15) D. Charlesworth, "Roman Window Glass from Chichester, Sussex", JGS 19 (1977), 82.

16) On different kinds of moulds (ceramic, wooden), cf. G.C. Boon, "Roman Window Glass from Wales", *JGS* 8 (1966), 44-45.

frequently made even more difficult by the actual condition of the glass. With regard to the Marea glass, one cannot be completely sure of the identification.

"Muff" glass is believed to have come into use in Roman-controlled territories in the 4th century AD.[17] It gradually pushed out of production "cast-glass" windowpanes, which remained in use chiefly from the 1st to the 3rd centuries AD.[18] "Muff" glass dated from the early 5th to the early 7th centuries was recorded both on Near Eastern[19] and on European (British) sites.[20]

Windowpane glass constituted an important trading good in the Roman Empire. Diocletian's Price Edict of AD 301 lists maximum prices not only for raw glass and glass vessels, but also on windowpanes.[21] It is also apparent that architectural glass under the Early Empire was put to much wider use in the western provinces. It is generally believed that in Egypt it started being applied on a common basis not earlier than in the beginning of the 4th century. Oxyrynchus papyri of this age nicely reflect the scale of the demand for this product. A source dated to AD 326 mentions 6,000 pounds of glass being used in the construction of a bath.[22] Whether this was merely window glass or whether the total also included mosaic cubes for decorating walls and floors, it is impossible to say.

17) Ibid., 45.

18) Harden, "Roman Window-Panes from Jerash and Later Parallels", *Iraq* 6 (1939), 91; L. Taborelli, "Elementi per l'individuazione di un'officina vetraia e della sua produzione a Sentinum", *ArchCl* 32 (1980), 138-173.

19) P.V.C. Baur, "Other Glass Vessels", in: C.H. Kraeling, Gerasa: The City of the Decapolis (New Haven 1938), 546. Ch. Lahanier, "Verres", in: P. et M. Canivet, Huarte. Sanctuaire chrétien d'Apamène (IVe-VIe s.), vol. 1 (Paris 1987), 333, fig. 87; Saldern, Sardis, op. cit., 91-92.

20) R. Cramp, "Window Glass from the Monastic Site of Jarrow", *JGS* 17 (1975), 88-95; cf. D.B. Harden, "Domestic Window-glass, Roman, Saxon and Medieval"; in: Studies in Building History (London 1961), 39-63.

21) E.T. Erim, J. Reynolds, "The Aphrodisias Copy of Diocletian's PE on Maximum Prices", *JRS* 63 (1973), 99-110.

22) P.Oxy., vol. 45, no. 3265, cf. also discussion in E.M. Stern, "Roman Glassblowing in a Cultural Context", *AJA* 103, 3 (1999), 464-466.