Glass Vessels from the Souk Excavations in Beirut - BEY 006

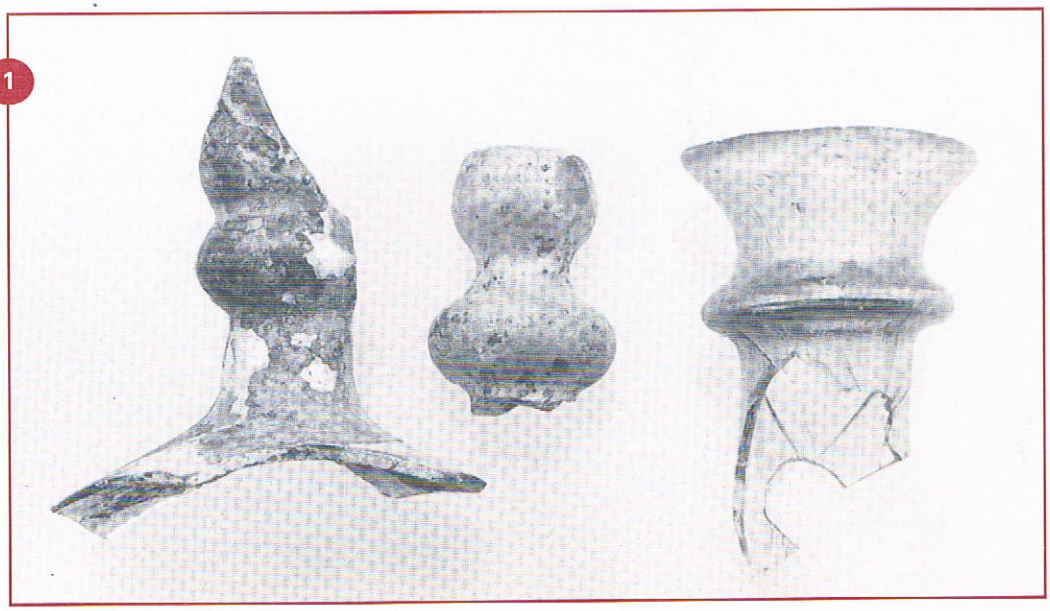
Sarah Jennings
English Heritage

Lebanon has long been known as an important area for the making of glass vessels. Pliny in the third quarter of the first century AD wrote about Sidon as a significant centre for the manufacture of high quality glass vessels, and archaeological evidence has shown that glass vessels were made in the Syro-Palestinian area for at least two centuries before that. A huge number of pieces of glass were found during the excavations of BEY 006, the area of the Souks in Beirut Central District, reflecting the long tradition of making glass vessels in this area.

Excavations in urban areas results in the retrieval of vast amounts of material, but because most of this represents the refuse of the past -- what was broken or no longer of any use, and so discarded -- very few complete items are found. This is particularly true of glass as it is so easily broken. Glass, along with nearly all types of metal, was also recycled in ancient times and many glass workers would have obtained a significant proportion of their raw material from vessels broken and discarded at the time. But despite their fragmentary nature these broken fragments have the potential to reveal a great deal of information about the forms and the relative numbers of the glass vessels available in Beirut from the late Hellenistic period onwards.

The earliest glass vessels found on BEY 006 were made by the core formed method. This involved making a core to the desired shape and size from a mixture of sand and straw or dung, letting it dry and then dipping it in molten glass. Contrasting glass threads, usually in several different colours, were then wound around the vessel, a pointed implement was used to pull these threads alternately up and down across the threads creating a combed or zig-zag effect. When the finished vessel had cooled down the sand core was painstakingly picked out, but however carefully this was done a thin residue of sand always remains where it fused with the molten glass, and this is one of the ways small fragments of these vessels were identified. Making glass vessels this way would have been a slow process; it also severely limited the sizes and shapes that could be produced. Only six pieces of core formed glass have been found from 006 (Fig. 1), but these include two rims from small bottles called alabastrons, so called after the alabaster bottles that they copied. One is in blue glass with a yellow trail around the projecting rim edge, the other was made from glass that appears black and has a white trail.

The next significant development in making glass vessels was the cast or slumping method. Molten glass was poured on a flat surface and flattened to form a disc; this was then placed over a mould or form and the still soft glass slumped to take the shape of the mould.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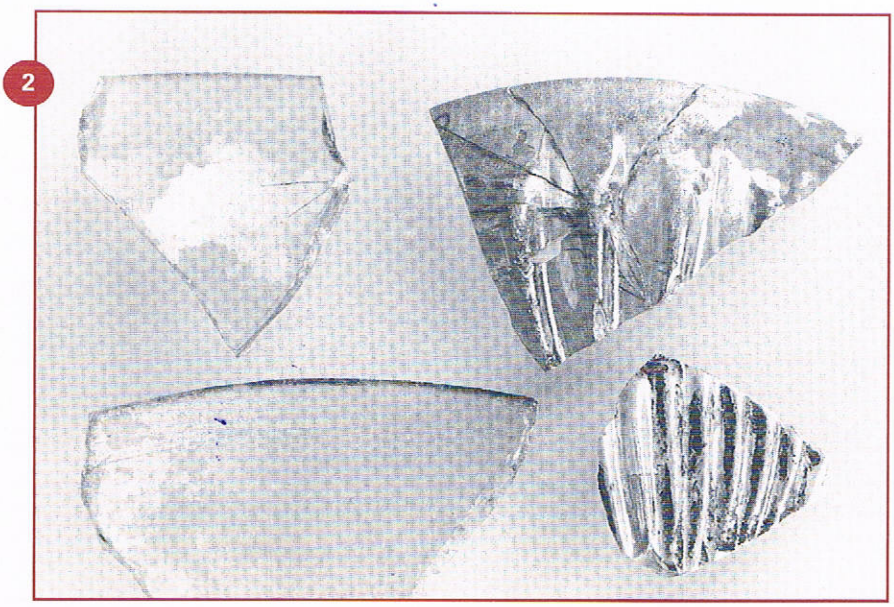
Some experts maintain that this could be done in a single operation, while others are of the opinion that the glass on the mould would require reheating at this stage. Once the glass had taken the shape of the mould it could be removed when it was sufficiently hard, and when cold the inside of the vessel and the rim edge were rotary polished to remove any irregularities. Nearly all examples have one or more cut concentric circles, either singly or in groups at one or two points on the inside. The casting or slumping method of manufacture restricted the shapes that could be produced to open forms, mainly cups and bowls, and many of these copied the contemporary ceramic or metal vessels. Nearly all the earlier examples had semi pointed or rounded bases and it is presumed that they were used in conjunction with a stand. More complex forms were made, or cast, in moulds comprising two or more parts, but only a few possible examples of these have been found on the excavations. A large number of fragments of these so-called cast vessels have been recovered and they represent the range of forms of cups and bowls available locally for two to three hundred years, until the end of the 1st or the beginning of the 2nd century AD (Fig. 2). The earliest cast vessels were conical or hemispherical in shape and were made from naturally coloured glass, shades of greeny-blue, from the iron impurities in the sand used to produce raw glass. A few examples are yellowish in colour and a small number have been intentionally decoloured with the addition of small amounts of manganese to the molten glass, resulting in a nearly colourless vessel. Although many of these cups are quite thick at the rim, they frequently taper to very thin lower walls, about 1mm, towards the base.

A later version of the cast cups and bowls is known as ribbed or pillar moulded. These vessels have numbers of ribs running either vertically or slightly slanting from just below the rim and tapering towards the base. The examples from BEY 006 show the wide variety in the size and spacing of the ribs. One possible method of making these vessels has been discussed by Guddenrath (1991, 222) where he suggests that the ribs could have been made by pressing the flat disc of glass with an incised ribbed former before it is placed over the mould. Some of the fragments show the traces of where the outside of the rim and an area below it has been ground down to even up both the rim and the tops of the ribs. A few of these pillar moulded bowls from the Souks Excavations were made from intentionally coloured glass resulting in definite green and purple vessels; the later examples found in a cistern were made from very pale blue/green glass.

Making glass vessels by the blowing or inflation method is thought to have started towards the end of the 1st century BC, but exactly where and when is still uncertain. What is known though is that by the second half of the 1st century AD this technology was wide spread and in fairly common use; for the first time glass could be made into a wide variety of forms quickly and therefore fairly cheaply. As a result the numbers of glass vessels in circulation rose dramatically as they had ceased to be luxury products, and this change to utilitarian every day products is reflected in the archaeological record with a dramatic increase in the numbers of pieces found.



1. Fragments of core formed glass
2. Fragments of late Hellenistic and early Roman cast glass

Glass makers were no longer restricted to specific types of forms constrained by the methods of manufacture, and vessels for drinking, serving food, storage of large and small amounts of liquids, were all readily available. Glass was made into complex shapes, often with elaborate decoration, all over the Roman Empire and many of these can be seen in the collections of Roman glass in museums throughout the world. However, the pieces found on the Souks excavation mainly represents the commonly available and fairly basic end of the market. Many of these rapidly produced vessels have cracked off rims, showing that they were manufactured using a one stage approach rather than the two stage method involving the use of a pontil iron. Cracked off rims are the result of either scoring a line around the inflated bubble, tapping it sharply so the fracture spreads round the sphere, or of applying a thin trail of hot glass round a shaped but cooling bubble. In the latter case the strain caused by rapid expansion in a specific line causes part of the bubble to 'crack off' leaving a vessel with a sharply formed rim edge. Many of these rims were left as they were made, which was usually with a very clean break, but some were specifically ground and rounded resulting in a very smooth edge. Grinding wheels were also used to cut decoration grooves in the vessel walls, and to form narrow bands with a slightly rough abraded surface. It is thought that these bands had a practical as well as a decorative function in that they made cups and beakers easier to handle and less likely to slip. By the 4th century AD this method of making vessels was widely used for the glass available in Beirut, and a variety of cups and bowls in a range of sizes have these distinctive cracked off rims. Some are so thin, particularly in the middle of the vessel, 0.5mm or even less, it is surprising that they could be used at all and in part explains the large numbers found on the site.

Several new forms became increasingly common in the late Roman and Byzantine period. These include stemmed drinking vessels and several types of glass lamps (Fig 4). Although the bases of both the goblets and lamps were very common finds from the excavation, partly due to the substantial construction of this part of the vessel, no complete examples were found. Using the available fragments and complete parallels in museum collections (Hayes 1975, Matheson 1980) it has been possible to reconstruct a number of these, and in the case of the lamps, work out how they were used.

A type of decoration using thin trailed threads of glass in a contrasting colour to the main body of the vessel is particularly common in the early Byzantine period. Vessels were made in what was probably a natural coloured glass, a pale slightly greeny-blue, and the trailed threads were in a deep blueglass which was achieved by adding relatively small amounts of cobalt to the batch. Blue trail decoration has been found on both closed forms -- flasks and bottles -- and on open forms -- bowls, dishes and goblets -- but usually just as a single band on or just below the rim edge on the more open forms. On flasks and bottles one of the typical forms of this style of decoration is found on flaring or funnel shaped necks and two thick trails are separated by a very thin trailed spiral (Fig. 3). Decoration on the bowls and goblets is often limited to a single thick trail which in the bowls with a folded over rim is usually encased in the fold.

Glass finds dating to the 8th century AD and later are limited on the Souks excavation but there are a few distinctive vessels which date to the Islamic (9th/10th century) and Mamluk periods (fig. 4). Nearly all the Islamic vessels are identified by their decoration which takes the form of deep facet cutting. This was done with great skill and often on very small vessels, the smallest example would have been only about 30 mm high (the top few millimetres of its neck are missing). Two of these small bottles and a number of other fragments were made from extremely good quality colourless glass. This, together with their shape and type of decoration, suggested that they may represent traded items and a possible source could have been Fustat (near modern Cairo) in Egypt. The glass is undergoing analysis to allow comparison with other known samples and it is hoped that results of this will provide a more definite answer.

A few vessels can be dated to the Mamluk period; again these are distinctive shapes. Most of them are tall neck flagons and bottles with the open or closed bulges more or less in the middle of the neck, a typical feature of this period. Only one fragment of the well known gilded Mamluk glass has been found and this was from a beaker, the other identifiable form of this period. Unfortunately none of the actual gold survives, but only the ghost impression of where it was on the vessel. The small remnant that survives appears to be part of an Arabic inscription rather than a series of decorative motifs; this however awaits further research. A few examples of sprinklers were found, usually these are only identifiable from their distinctive narrow necks and very small openings (Fig 8.1). Part of a deep blue sprinkler also has a flattened

body, another feature common to this form.

Research on the glass from BEY 006 is progressing well, but is by no means yet finished. Because of the fragmentary nature of most of the material detailed comparison with complete vessels in museum collections such as those from The National Museum of Lebanon, the American University of Beirut (AUB) Museum and the Beiteddin Museum has been invaluable. In return the glass from the Souks excavations will help to suggest both possible source areas and date ranges for these often unattributed vessels. Work on the AUB/Rakow Glass project has been undertaken by the author, Joanna Abdallah, George Haggarty and Tania Zaven, and this has been supported by the Rakow Grant for Glass Research USA, SOLIDERE, and the AUB/Leverhulme project. Prof Helga Seeden has given this project her continued help and support without which none of this would have been possible.

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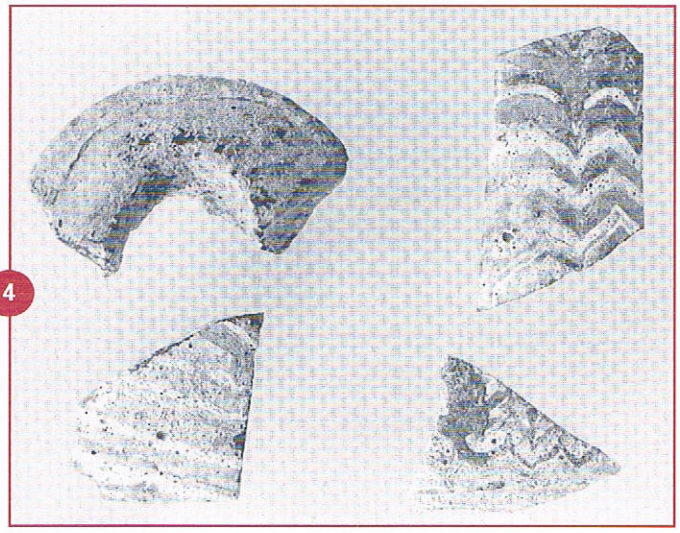

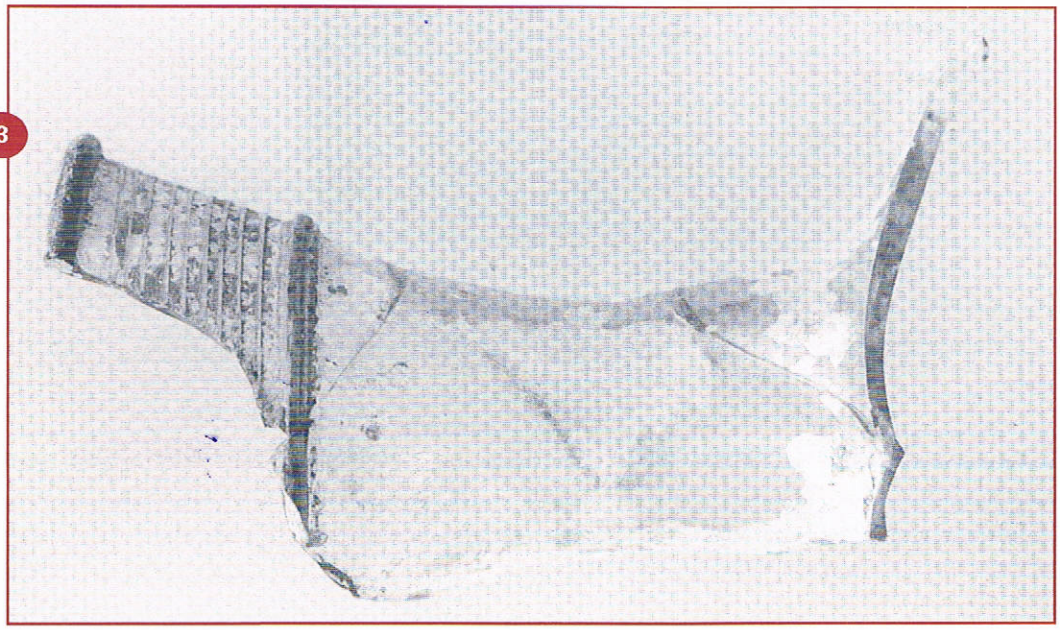

3. Blue trailed neck
4. Necks from Mamluk period bottles