The Cutting Edge: Problems of History, Identification and Technique of Fatimid Rock Crystals

Anna Contadini

For Ralph Pinder-Wilson,
who taught me how to look at rock crystals

During the Fatimid period Fustat and Cairo were major centres of industrial, artistic and cultural activity. Buoyed up by a prosperous economy Egypt produced a wide range of luxury goods, and new artistic enterprises evolved linked to technical innovations and industrial development. For example, there was a burgeoning industrialization of textile manufacture which included the luxury production of tiraz textiles, both for internal consumption and for export; ceramic production entered an age of experimentation where a wide range of bodies was produced including, earlier than elsewhere in the Islamic world, frit ware; glass production, very diverse and rather difficult to classify exactly, increasingly encompassed carved relief and lustre painted and mould blown items. In metalware we encounter the innovation of the rather free stylistic conventions, with Hellenistic roots, that one also sees in painted ceramics, in ivory and woodwork, or in what little remains of painting on paper. Unfortunately, because of the dispersal of the Fatimid library, not much remains of illustrated manuscripts, and what there is is fragmentary. Even examples of illuminated Qur’ans from the period are extremely rare. However, we are fortunate that one complete

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1 See Masqaddasi 1994, p. 181.
3 Porter and Watson 1987, p. 189; also Contadini 1998 a, p. 73.
4 Pinder-Wilson and Scanlon 1973; Bass 1984 for Seré Limani’s glass; also Contadini 1998 a, Chapter 4.
5 As in animal figures, for example the deer in Munich, Bayerisches Nationalmuseum: Munich 1912, Pl. 155; the deer in Naples, Museo di Capodimonte: Scurato 1966, Pl. 31; the lion in Cairo, Museum of Islamic Art: Cairo 1969, no. 47.
6 For examples see Philon 1980 pp. 163-81 and Plates XXI-XXV. Ethington 1956 has defined this style as “realistic”, but this has been very convincingly disputed by Grube 1976, pp. 140-144 and Grube 1984. For the influence of a classical, Hellenistic tradition on Fatimid art see Grube 1962.
7 Like plaques in Paris, Musée du Louvre: Migeon 1927, Fig. 148; in Berlin, Staatliches Museum für Islamische Kunst; Kühnel 1971, p. 68-69, no. 88, Pls. XCII-XCVIII; in Florence, Bargello Museum, inv. no. 800; Kühnel 1971, p. 24 and 70-71, no. 90 A-F and Pl. XCIX.
8 See for example the panels from the Fatimid palace: Pauty 1931.
9 As for example in the painting of a ciotèl, in the Metropolitan Museum of Art in New York: Grube 1963.
10 Some 158 fragments have been listed by Grube 1985. A large part of the painted fragments from Fustat is in the Keir Collection: Grube 1976.
11 Some detached pages may be attributed to the Fatimid period as, for example, one in vellum with gold letters in the Victoria and Albert Museum, inv. no. Ms.L.31-1985; Contadini 1998 a, fig. 9. The famous Blue Qur’an also most probably belongs to 10th century Fatimid North Africa: Bloom 1989.
example has survived, now in the Chester Beatty Library in Dublin\(^\text{1}\). It is dated AD 1037 (AH 428) and can be attributed to Fatimid Egypt on the basis of the correspondence between its decoration and calligraphic style and those seen on Egyptian architecture and wooden panels of the 11th century. Finally, there is the subject of this paper, rock crystal, the production of which is marked by technical innovation and by the highest artistic standards.

Rock crystal is a colourless, transparent quartz, quite common in the earth’s crust, occurring in hexagonal crystals of very varied dimensions. According to al-Bir\(\text{r}\)\(\text{u}\)\(\text{m}\)\(^{\text{a}}\) (end of 10th-first half of the 11th century) it was imported from East Africa, the Laccadive and Maldives Islands, and Kashmir. He also states that it is found in Azerbaijan and, in abundance, in the Pamirs and Hindukush, but because of poor quality nobody bothers to import it to Ba\(\text{s}\)ra, for him the main centre of skilled craftsmanship in this medium.

A little later (second half of 11th century), N\(\text{a}\)\(\text{r}\)\(\text{i}\) Khusraw\(^{\text{14}}\) tells us that fine unworked crystal was imported to Egypt from Quzum on the Red Sea and he also gives an eyewitness account of the working of pieces in Fatimid Cairo. We are thus offered information on a wide range of sources of supply, opinions about variations in quality, and references to two major centres, Ba\(\text{s}\)ra and Cairo, for the working of rock crystal in the 10th to 11th centuries.

Just under 200 carved rock crystals of the early Islamic period have survived. The majority were fashioned as containers such as flasks, dishes, and bottles; other objects include a number of chessmen, while smaller pieces were worked as animals\(^{\text{2}}\). Many are now preserved in royal and church treasures in Western Europe. I should like to say something about how they got there, and about the uses to which they have been put, but first I intend to discuss some of the major problems surrounding the study of these rock crystals. These involve questions of identification, dating, stylistic affiliations and techniques of production. The most basic question to address is how a piece can be identified as Fatimid at all, other than from other times and places in the Islamic world, or even as pre-Islamic, Byzantine, or European.

In fact, with so many rock crystal pieces being held in European collections, objects now acknowledged as of Islamic origin have in the past been treated very largely as a form of European medieval art. The rock crystal ewer in the Victoria and Albert Museum (ill. 48), for example, was bought by the Museum in 1862 as a Byzantine object, — incidentally for £450\(^{\text{3}}\).

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12 Is 1430: Arberry 1967, no. 42, p. 15; Contadini 1998 a, p. 10 and figs. 7 and 8.
13 Al-Bir\(\text{r}\)\(\text{u}\)\(\text{m}\) 1936.
14 N\(\text{a}\)\(\text{r}\)\(\text{i}\) Khusraw 1881, p. 149.
15 A good number of these are included in Lamm 1929-30, while others are treated in various articles. For rock crystal chess pieces see Contadini 1995 a.
16 Inv. no. 7904-1862: Contadini 1998 a, Plate 7 and fig. 18.
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But there are cogent reasons for an attribution to Fatimid Egypt of several rock crystal vessels. For three, indeed, the evidence is incontrovertible: they have Arabic inscriptions which relate them to known personages, and hence fix them in both time and place. One of the ewers in the treasury of San Marco in Venice (III. 45) bears a dedicatory inscription to the Fatimid al-¢ Aziz (r. AD 975-996/AH 365-386)¹; the ewer in the Pitti Palace Museum in Florence (III. 46) has an inscription which refers to the Fatimid general Husain ibn Jawhar, and is therefore datable to AD 1000-1008 (AH 391-399)²; and a crescent-shaped piece (probably part of a horse trapping) in the German Museum at Nuremberg (Fig. 1) is inscribed with the name of al-Zähir (AD 1021-1036/AH 411-427)³. Closely related to the two ewers with identificatory inscriptions are one in the Louvre (III. 47) with an Italian, early 12th-century gold filigree lid⁴; one in the Cathedral of Fermo (III. 49) which has a missing handle, and an early 17th-century enamelled mount, transformed into a reliquary⁵; a second one in the treasury of San Marco (III. 50), which also has a missing handle, and a Venetian, 13th-century silver mount⁶; and the one in the Victoria and Albert Museum (III. 48)⁷. There are two other known ewers, one in the Hermitage at St. Petersburg and the other in the treasury of the church of Milhauget, that are not usually included among this group. They were classified by Lam⁸ as Egyptian, 11th-century, but Kurt Erdmann⁹ disagreed and considered them not of Islamic origin. However, in the catalogue of the exhibition at the Hayward gallery in 1976¹⁰ that in the church of Milhauget was considered as a Fatimid piece of the 11th century. They evidently deserve further study in order to clarify problems of identity and dating.

The stylistic evidence for the unity of the group of six ewers is overwhelming. All are of one piece including the angled handle; they all have the same pear-shaped body; the height is very similar, ranging between ca. 16 and 19 cms; the decorative elements, consisting of stems, half palmettes, line and disks, and the techniques of carving are likewise very similar. The conclusion is inescapable: they must belong to the same period and must have been worked by the same lineage or school of craftsmen.

Various of the above stylistic features are also found on other pieces, and the similarities are sufficiently strong to justify the conclusion that these, too, are of Egyptian provenance⁹. Circumstantial evidence can also be cited in support: Nāṣir-i Khusrav, mentioned above, who visited Fatimid Egypt between AD 1046 and 1050 (AH 438 and 442), tells of finely worked rock crystals produced and sold in the lamp market in the Cairo bazaar; and the description by the Qādī Ibn al-Zubayr of the palace treasury of the Caliph al-Mustansir (r. AD 1036-1094/AH 427-487) speaks of a multitude of rock crystal vessels⁸. We thus have conclusive evidence of Fatimid rock crystal production, of court patronage, and of the existence of commercial workshops producing for the open market.

17 Inv. n° 80: Erdmann 1971, cat. no. 124. See also Contadini 1995 b: Contadini 1998 a, p. 19, fig. 15 and Contadini 1998 b, cat. no. 87.
18 Inv. n° 1917: Rice 1936. The piece was recently destroyed.
19 Germanisches Nationalmuseum, KG 695: Erdmann 1998 a, fig. 17.
21 See Grube 1993, n° 58.
22 Inv. n° 86: Erdmann 1971, cat. n° 125.
23 See note 16.
24 For both see Lamm 1929-30, Tafel 67, 5 and 6.
25 Erdmann 1953.
26 Hayward 1976, n° 112.
27 As, for example, a flask and a cylindrical bottle in the Victoria and Albert Museum, inv. n° (respectively) 1163-1864 and A.45-1928: Contadini 1998 a, Plates 6 and 4; and a flask in the Keir Collection, inv. n° R.11: Finder-Wilson 1988, n° R.11.

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Fig. 2 Glass ewer cut in relief, found at Fusjat, 9th century (?). H. 19 cm, Diam. of belly 10 cm. Cairo, Museum of Islamic Art, inv. no. 71.6.34.

Fig. 3 Glass ewer in cameo relief, Persia (?), 10th-11th century. Corning Museum of Glass, inv. no. 85.1.1, (see Ill. 20).

Fig. 4 Glass fragments cut in relief, found at Samarra, 9th century. Berlin, Islamic Art Museum.
Accordingly, scholars have tended to attribute all the extant medieval Islamic rock crystal objects to Fatimid Egypt. However, in 1951 Kurt Erdmann 29 proposed, on the basis of stylistic comparisons, a chronology in which certain pieces are considered pre-Fatimid, their bevelled cut, as in the rock crystal knobs on the candlesticks of the treasury of San Marco, recalling Tulunid 9th century woodwork 30. But if his general chronology be accepted, what is questionable is the continuing attribution of all pieces to Egypt.

As we have already seen, textual references indicate that rock crystal was worked elsewhere in the Islamic world; and they indicate, further, that objects of this kind were known in Syria and Mesopotamia during the Umayyad and Abbasid periods. For example, the account of al-Ṣūfī 31 (d. AD 947/AH 335), who speaks of the Abbasid Caliph al-Rāḍī (r. AD 934-940/AH 322-329) as a rock crystal collector, also supports the theory that there were probably pre-Fatimid centres producing rock crystal objects in Iraq.

Stylistically, there is the important and partially neglected evidence of cut-relief glass. The connections between rock crystals and cut-relief glass are underlined by a glass ewer excavated at Fustāṭ 32 (Fig. 2) which, in addition to the similar shape of the body and handle, has two features that relate it very closely to the crystal ewers. One is that the carved decoration is interrupted behind the handle, the other that the carved kufic inscription is in exactly the same position, around the shoulder, as in the āl-ʿAẓīz rock-crystal ewer in the treasury of San Marco. The glass ewer from Fustāṭ has been dated not later than 9th century. However, the evidence of the carving would suggest that it was modelled on a rock crystal since the interruption of the carving beneath the handle, which on the glass piece is not integral to the body but attached later, clearly points to a rock crystal design providing the prototype rather than the reverse. At the same time the relationship between them suggests that cut glass production elsewhere could equally be associated with rock crystal production.

For example, among pieces found in Iran we may cite the Buckley, a glass ewer in the Victoria and Albert Museum 33 (III. 44). Although unfortunately very fragmentary this is clearly of exactly the same shape as the Fatimid rock crystals, and is very similar in decoration. But it also has a low foot characteristic of Sasanian silver vases, and close analogies to the pear-shaped body of the ewer, with its characteristic handle, are provided by Sasanian bronze objects too. Given the eastern provenance of the Buckley ewer the level of similarity between it and the Fatimid ewers is such that it becomes hazardous to assign other related pieces to Egypt rather than Iraq/Iran. There is, for example, a glass ewer in the Corning Museum (Fig. 3, see III. 20) which has a decoration practically identical to that of both the Buckley and the V&A rock-crystal ewer; but because it was acquired in Iran it has been considered Iranian 34.

Whether Iranian or Egyptian, we thus have a number of cut-glass pieces that closely resemble rock crystals. They exhibit a common repertoire of designs and carving techniques that reinforces the assumption that the two crafts overlapped and probably had a common origin. It thus seems logical that the origins of the craft of working rock crystal should be sought in those regions where there already existed a tradition of hardstone carving and glass cutting. In the early centuries of the Roman Empire centres for these related crafts existed in both Egypt and Syria. But these gradually declined, being supplanted by those of Constantinople, Italy and other centres in the more northerly regions of the Empire. In Persia, on the other hand, there was a flourishing industry of

29 Erdmann 1951.
30 Inv. n° 24 and 25: see Erdmann 1971, n° 121 and 122; Ettinghausen 1952.
31 Al-Ṣūfī 1935, p. 20.
33 Inv. n° C.126-1936: Contadini 1998 a, fig. 19.
34 The ewer is in the cameo glass technique, colourless glass with a thin light green overlay, Clara S. Peck Endowment 85.1.1 H. Whitehouse 1985.
relief cut glass under the Sassanian emperors, and there is no disputing the Persian provenance of the so-called "Cup of Solomon" now in the Bibliothèque Nationale in Paris.\(^8\) (III. 52). The large central roundel is of rock crystal carved in relief, with a bevelled cut, with the Sassanian emperor seated on a throne supported by winged horses. We do not know where the dish was made, but a likely place would have been the Sassanian capital Ctesiphon, in present-day Iraq. The survival of a late pre-Islamic tradition of rock-crystal and glass carving in Iraq into the early Islamic period is suggested by glass finds from Samarra\(^9\) (Fig. 4) and it is logical, consequently, to hypothesize that the earliest Islamic rock crystal carvings were made somewhere in Iran or Iraq.

We have, then, the likelihood of a centuries-old rock crystal tradition in the east (with a possible prolongation into the 11\(^{th}\) century, at least at Basra); and the certainty of Egyptian production in the late 10\(^{th}\) and early 11\(^{th}\) centuries. The similarities we have seen suggest the possibility of the transfer of motifs and techniques between these two centres. In the absence of an adequate documentary and archaeological record we still have to rely mainly on stylistic criteria to establish identity, provenance, and dating. But, as we have seen, closer analysis reveals a more complex picture than hitherto suspected: a Fatimid identity should not so readily be taken for granted.

I should like now to turn to questions of technique. The crystal of the V&A ewer is very clear, and the object is very light. I was able to measure the thickness of the body, which is 1.7 millimetres for the ground body and just over 2 millimetres for the parts with the relief decoration. This is extraordinary in relation to the size of the object, and the question arises of how such thinness was obtained. But despite the abundance of Islamic rock crystals we have no technical information on production in the Near East. Nevertheless, we can at least outline the general principles on the basis of treatises like the Gemmarum et Lapidum Historia of Anselme Boece de Boodt; contemporary accounts of traditional German and Chinese lapidaries; and iconographic evidence from India.

From the raw crystal, the shape of the vessel was probably first roughly cut with a saw and chipped with a small metal hammer. But how was it hollowed out? Considering that there is only one opening, the mouth, which is very small in relation to the size of the belly, one has to pose the question of how this was achieved. Michel\(^{17}\) pursued enquiries in 1960 with a group of old lapidaries in Idar-Oberstein where there is centuries-old tradition of hard-stone cutting. Their technique of carving the interior of vessels is matched by that reported for Chinese hard-stone carvers, and could very well have been the technique used by the Fatimid rock-crystal carvers working on the ewers. This can be reconstructed as follows:

First, a hollow, rotating tool was used to extract a cylindrical core and, if needed, the depth of the cavity could be extended by a drill. To widen the cavity one or more steel wires were then introduced in the central hole (Fig. 5). When lightly pressed, these would curve and, with the help of an abrasive, like sand and water, scratch the inner wall until they had carved out the interior of the vessel as required. As a piece in the British Museum\(^{39}\) demonstrates, if cut rock crystal is not polished it retains a matt appearance, so there remains the further task of smoothing and polishing the interior surface, and for this a steel wire with an abrasive in the shape of a small mass of emery could have been used.

Even if preparatory, the above are all very delicate operations requiring great skill and a thorough understanding of the fracture planes of the mineral. For the exterior, after the initial shaping with saw and hammer, the lapidary most probably used the bow lathe to obtain the fine detail. This was a fixed spindle to the head of which was attached a cutting drill or wheel. One hand rotated the spindle by pushing the bow backwards and forwards while the other grasped the crystal, mani-

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36 In Berlin, Museum of Islamic Art: Fig. 12; see also Lamm 1928, pl. VI.
37 Michel 1960.
38 Inv. n° 1959, 5-15, 1.
Fig. 5 Techniques of hollowing out a rock crystal ewer.

pululating it against the head, as depicted in a miniature from an early 17th century album for Jahangir of a lapidary cutting a ruby (III. 53).

There remains the question of how the finished objects eventually reached Europe, and how they were perceived and used. It is clear that one of the major sources of supply was the Fatimid treasury, which also included Abbasid items. When the treasury was dispersed a large number of works in rock crystal flooded the market. Spain and Sicily no doubt played an important role, but some of these objects must have come to Europe with the Crusaders, possibly reaching Venice via Acre or Jerusalem in the 12th century. However, many had been incorporated into the Byzantine imperial treasure, and only arrived in Venice after the sack of Constantinople in 1204, or, indeed, after 1261 when the Venetians were forced to abandon the city. For example, the extraordinary rock crystal vase in the treasury of San Marco – the largest known Islamic rock crystal object – which is probably pre-Fatimid, arrived in Venice in the mid 13th century, and was then mounted by two Venetian goldsmiths.

The majority of these objects arrived in Church treasuries as princely donations already having been given their precious mounts. Of the others some were mounted by the Church in recognition of the princely gift. In this respect they were no different from the mounted secular antique and

39 In the Náprstek Museum in Prague: Hájek 1960, pl. 16.
40 Ermann 1971, n° 123.
41 See, for example, the account of Abbot Suger of the Queen of Aquitaine vase: "Still another vase, looking like a pint bottle of beryl or crystal, which the Queen of Aquitaine had presented to our Lord King Louis as a newly-wed bride on their first voyage, and the King to us as a tribute of his great love, we offered most affectionately to the Divine Table for libation. We have recorded the sequence of these gifts on the vase itself, after it had been adorned with gems and gold, in some little verses 'As a bride, Eleanor gave this vase to King Louis, Mitrdolus to her grandfather, the King to me, and Suger to the Saints'; Panofsky 1979, p. 79. This is the famous Eleanor Vase now in the Louvre (M. R. 340), for which see Montesquieu-Fesztenae 1973-77, vols. 1 and 2 n° 75, vol. 3 pp. 63-64, Plates 47-48 and Paris 1991, n° 27. The rock crystal vase is not of Fatimid origin as often assumed but, as well argued by Beech 1992, of Iranian, Sassanian origin (5th to 7th century). Beech also identifies the mysterious Mitrdolus with 'Abd al-Malik ibn Hūd 'Imād al-Dawla (1110-30), the last Muslim King of Saragossa (Northeastern Spain).
Byzantine objects, in various semiprecious stones, which found their way from medieval European courts into Church treasuries. Some of the Islamic objects so transformed were not put to Church use, but simply displayed. Others, such as chalices, changed their function from secular to sacred. Yet others were put to new uses, as in the case of reliquaries, such as the Islamic rock-crystal bottle transformed by a silver gilt serpent handle and a dragon spout into a Gothic ewer42 (ILL. 51). It was given by Pope Clement VII to the church of S. Lorenzo in Florence, and used as a reliquary containing the bones of Saint Mary Magdalen and Saint Christine. But the most striking example of such a transformation is provided by the reliquaries of the Holy Blood, the best example of which being that in the treasury of San Marco43 (Figs. 6 and 7). The mount, by Venetian goldsmiths, is included in the description of the reliquary in the earliest remaining inventory of the treasury of San Marco, that of 1283. The way that the ribbons seem to support the reliquary without touching it is remarkable: they emphasize rather than interfere with the beautiful carved decoration of the 10th-century Islamic rock crystal bottle. Around its shoulders runs a secular benedictory Arabic inscription, baraka wa al-'izz (“benediction and glory”), but with contrasting, involuntary irony, the inscription on the gold horizontal ribbon says Hic est sanguis Christi (“this is the blood of Christ”).

42 The spout is not functional, but merely decorative. Contadini 1998 b, n°, 208.
43 Inv. n°, 63: Erdmann 1971, n°, 128. For this and other Holy Blood reliquaries see Lamm 1929-30, Tafel 69, Tafel 68,13, Tafel 75,4, Gievernich and Budde 1989, cat. n° 446, fig. 636, Erdmann 1953, figs. 15, 16, 18.
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III. 45 Rock crystal ewer of the Fatimid Caliph al-Aziz, 975-996/365-86. European gold mount, 16th century or later. H. 23 cm (including mount); Diam. of belly ca. 12.5 cm. Venice, Treasury of San Marco, inv. n° 80.

III. 46 Rock crystal ewer, Fatimid Egypt 1000-8/391-9. European gold mount around the mouth. H. 15.6 cm; Diam. of base 7.7 cm. Florence, Pitti Palace, Museo degli Argenti e delle Porcellane, inv. n° 1917.

III. 48 Rock crystal ewer, Fatimid, early 11th century. H. 19.5 cm; Diam. of base 9 cm; thickness of the ground body 1.7 mm; thickness of the body with relief decoration ca. 2 mm. London, Victoria and Albert Museum, inv. n° 7904-1862.


III. 50 Rock crystal ewer, Fatimid Egypt, late 10th-early 11th century. Venetian silver mount, ca. 13th century. H. 28 cm (including mount), Diam. of belly ca. 10.5 cm. Venice, Treasury of San Marco, inv. n° 86.

III. 52 « Cup of Solomon », gold, granates, green glass and rock crystal, Persia, Sassanian period, 5th to 7th century. Paris, Bibliothèque Nationale, Cabinet des Médailles.

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