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Rock Crystal Vessels in Antiquity

PLINY REPORTS THAT rock crystal was formed from ice which had been hardened into stone through intense freezing.¹ Inasmuch as the Greek word, *ἡ κρύσταλλος*, meant both "ice" and "rock crystal," the idea must have had common currency in antiquity, and for once, it seems, the Greeks did not "have a word for it." The concept of metamorphosis by which metals and rocks were formed from water and earth had been discussed by Aristotle and by Theophrastus² long before Pliny's day, and he surely had ample literature to draw upon for his discussion of stones and metals.³ The notion that crystal was formed from ice lived on, for as late as the twelfth century Theophilus repeats it.⁴

Pliny went on to say that the best rock crystal came from India, but that it was also to be found in Asia Minor around Alabanda and Orthosia, in Cyprus, on an island in the Red Sea, in Portugal, and also in the Alps, where men had to be suspended from ropes to obtain it. He was unable to explain why it formed into hexagonal crystals.

We know today, of course, that rock crystal is colorless quartz, the crystalline form of silicon dioxide or silica (Si O_2). Being a hard stone, with a hardness of 7, it takes a high polish and is immune to the scratches of daily use. Like obsidian, agate, alabaster, many marbles and other stones, rock crystal posed a challenge to the ancient lapidary, and he had taken his hand and tools to the material before the middle of the second millennium B.C.

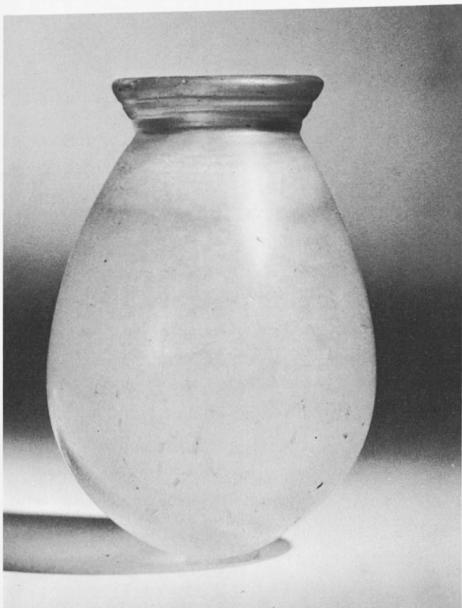
In the Mediterranean world two superb vessels testify to the skills of these anonymous craftsmen: a bowl with a duck's head handle from Mycenae, found in a tomb of Grave Circle B and dated to about 1550 B.C.,⁵ and a rhyton from the recent excavations at Kato Zakro in eastern Crete, dating from ca. 1450 B.C.⁶ The duck's head bowl is said to be an import from

Crete; the rhyton was surely made at Zakro, for not only is the shape in keeping with other stone vessels from the site but the raw material for the lapidary, a mass of crystalline quartz, was found in a workshop area by the excavators.

Although these two examples are perhaps the most familiar to the Classical scholar, they are not the earliest known in the ancient world. Recent excavations at Acemhöyük, south of the Great Salt Lake in Turkey, have revealed in Middle Bronze Age levels, dating from the nineteenth and eighteenth centuries B.C., two tolerably complete though broken rock crystal jars, and fragments of at least three other vessels.⁷ The larger of the two complete jars has a body in the form of a fluted cone and a constricted neck of concave profile. Two holes opposite one another at the widest point of the body served to attach handles.

In Egypt rock crystal was used for containers at a much earlier period, as excavations at Sakkara have shown,⁸ but none of the surviving pieces or fragments is so fine as the vessels from Acemhöyük. We should call attention, however, to a jar in the Brooklyn Museum from the collection of Edwin Smith, who lived in Egypt from 1858 to 1876, which through the kindness of Bernard V. Bothmer is illustrated here for the first time. The jar is of the same shape as alabaster and terracotta jars of the XIIth Dynasty, and may be dated to the same period, or, more specifically, to the nineteenth century B.C.⁹ Although the quartz is somewhat milky and not quite transparent, there is no doubt that it was carved from a crystal.

After the dissolution of the Minoan and Mycenaean cultures, it is not until the time of the ascendancy of the Persian Empire in the eighth century that we again encounter rock crystal vessels. The major portion of a bowl engraved with a petal pattern, now in the Ashmolean Museum in Oxford, came from



Rock crystal jar in Brooklyn. Height 6.5 cm. Photo courtesy of The Brooklyn Museum.



Rock crystal jar in The Metropolitan Museum of Art, from Cyprus. Height 11 cm. (Purchased by subscription, 1874-76.) Photo courtesy of The Metropolitan Museum.



Left: rock crystal jar in The Metropolitan Museum of Art, from Cyprus. Height 8.2 cm. (Purchased by subscription, 1874-76.) Photo courtesy of The Metropolitan Museum.

Nimrud.¹⁰ Fragments of several small vessels, one from the neck of a bottle, another from the lower part of a tumbler, have been found at Persepolis.¹¹ These pieces are of exceptional interest because their occurrence coincides with the earliest use by glass-makers of colorless (in fact, de-colored) glass in the manufacture of glass vessels. Bearing in mind that glass was first utilized in the third millennium as a substitute for semiprecious stones, notably lapis lazuli and carnelian, we may be reasonably certain that the Persian craftsmen, experimenting imaginatively with glass in the eighth century, were intentionally making glass vessels, not of colored and opaque glass, as they had been accustomed to do, but instead of glass as clear as crystal.¹²

Contemporary with these fragmentary pieces from Persia are two complete vessels from Cyprus, today in the Metropolitan Museum of Art.¹³ Both are pear-shaped, necked jars, with two projecting lugs on the necks, pierced to take handles. The larger of the two has block-like contours, with sides and bottom only slightly rounded in profile, and with the body, shoulder and neck meeting at well defined angles. The smaller has well rounded contours, no shoulder proper, but identical neck and pierced lugs. In the Cairo Museum there are two bronze jars, with loop handles swinging from the neck, which provide close parallels to the larger of these crystal vases. The two bronzes are without provenience and are dated to the "late period."¹⁴ Knowing of my interest in these objects, Christine Lilyquist, Curator of Egyptian Art at the Metropolitan Museum, suggested that additional comparisons might be found among the objects published by Dows Dunham from the cemeteries at Kush; and, indeed, from El Kurru there is a small rose quartz jar of precisely the same shape as the larger of the crystals from Cyprus, as well as a stone and silver pendant of matching shape.¹⁵ These can be dated to the second half of the eighth century B.C. As a result, we are safe in saying that the two jars from Cyprus were probably made in Egypt at this time.

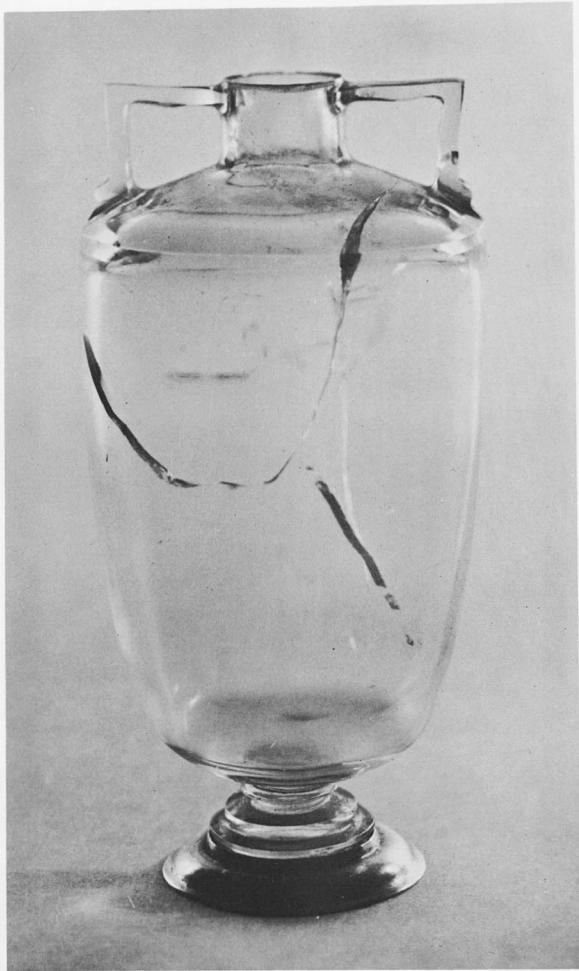
ALTHOUGH DURING THE CLASSICAL and Hellenistic periods rock crystal was occasionally

used in seal stones and incorporated into jewelry, vessels of the material are exceedingly rare. In fact, the one and only piece that comes to mind is the exquisite crystal alabastron from Cyprus in the Metropolitan Museum.¹⁶ With a stopper in the form of a crystal disk mounted in a gold tube and trimmed with gold filigree, this object must be counted as one of the stars of the ancient lapidary's conception and workmanship. What can be the reason for the lack of examples from this period, which was noted for the exuberance of its elaborate silver and polychrome jewelry and glass? Is it chance? Or is it rather, as I am inclined to believe, that rock crystal was too severe for the taste of the time?

In any event, whether after a real or apparent hiatus, rock crystal vessels again came into fashion in the early Roman Empire. Some two dozen amphoriskoi and small jars have been dated to the first centuries before and after Christ. One of these is a recent acquisition of the Museum of Art and Archaeology at the University of Missouri. The vase, an amphoriskos, is not a new find, for it can be traced back through several owners to the nineteenth-century collection of an Englishman, Alfred Morrison.¹⁷

Let us look closely at this vase: the body is barrel-shaped, the stem and foot intricately profiled, with the bottom part of the foot encased in a gold mount which appears to be modern; the neck is constricted, the shoulder has a gradual slope, and the angle it forms with the side of the body is beveled. Two elbow-shaped handles, square in cross-section with small knobs at the lower ends, project from the neck and shoulder. The mouth of the vase is missing and the neck has been ground down so as to be nearly flush with the top of the handles, evidently as a means of eliminating what otherwise would have been a chipped and irregular edge. Several fractures run through the body of the vase, yet it is not actually broken.

The shape of the amphoriskos, as well as many of the parallels mentioned below, in addition to some of the jars already discussed, was determined by the form of the quartz crystals, elongated hexagonal shafts. We may suppose that the first step in the manufacture of the



Rock crystal amphoriskos in The Museum of Art and Archaeology, University of Missouri-Columbia. Height 9.4 cm.

object was the boring of the interior. Obviously a hard abrasive was used, and it is possible that diamonds, which were well enough known at the time, were employed, although this is not certain.¹⁸ In any event diamonds were not crucial to the process, for well hollowed interiors had been achieved centuries earlier when diamonds were not available. The grinding and polishing of the exterior was probably completed by the use of Naxian emery, which Pliny says was the customary abrasive for finishing gems.¹⁹

A crystal amphoriskos, with similar elbow-shaped handles but with a body having stiffer contours and spreading outward toward the bottom, was found in 1957 in northern Italy, east of the southern end of Lago Maggiore, in the environs of Mercallo. The tomb from which it came can be dated to the mid-first century A.D. or a bit later.²⁰

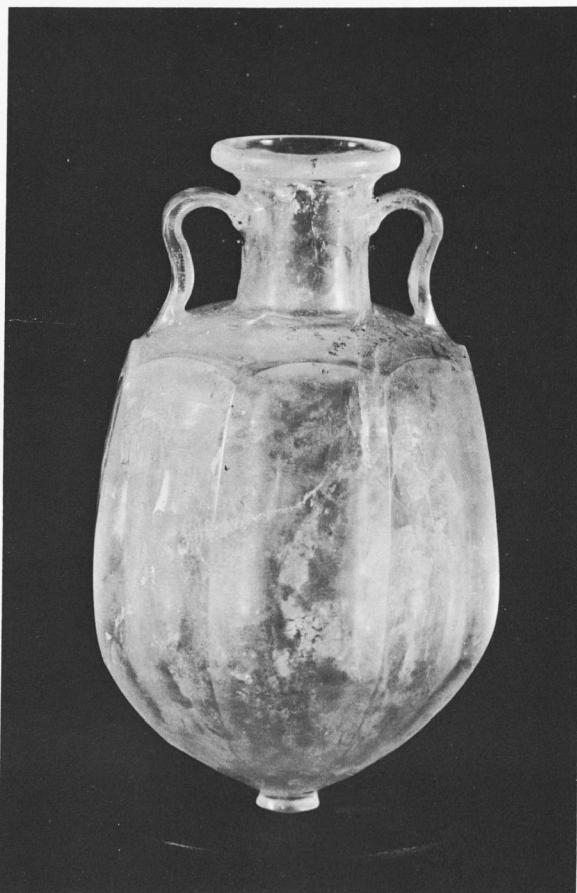
A date in the first century of our era is confirmed by comparisons to silver, glass, and other stone vessels. Hans-Peter Buehler has already noted the similarity of the handles on the Missouri vase with those on an amphoriskos of agate in the Staatliche Museum in Berlin-Charlottenburg, which came from the collection of Frank Calvert, a nineteenth-century United States consul in Turkey.²¹ Regrettably, the Berlin vase cannot be dated independently. Yet handles of comparable design occur on an agate aryballos in the Archaeological Museum in Istanbul, and this vase is known to have come from a sarcophagus burial of the first century A.D. at Pergamon.²² At least two crystal amphoriskoi, one close in profile to the Missouri vase, have been found at Pompeii,²³ and in the collection of silver from the Casa del Menandro at Pompeii there is a pepper pot of similar design.²⁴ Furthermore, the turned stem and foot can be matched on silver and glass objects of the early Imperial decades.

ADDITIONAL BARREL-SHAPED VASES of rock crystal, some with handles, some without, are to be found in museums at Aquileia, Pula (in Yugoslavia), Cologne, Athens, Berlin and London.²⁵ Other shapes exist as well: a pear-shaped alabastron was sold recently at Parke-Bernet Galleries,²⁶ while two even more accentuated

pear-shaped vases, both with curving handles, are in museums at Varese and Aquileia in Italy.²⁷ There is an octagonally faceted jar in the Museum of Fine Arts, Boston, illustrated here for the first time through the courtesy of Cornelius Vermeule, of special interest in that the eight-sided form represents a deliberate disregard for the six-sided shape of the crystal from which it was cut.²⁸

The carvers of rock crystal in the Roman period did not restrict their energies to vessels of small size. Pliny mentions a dipper that cost a lady 150,000 sesterces, and two cups that Nero, in a rage, smashed to pieces.²⁹ Cassius Dio calls attention to a crystal kylix accidentally broken at a banquet given for the Emperor Augustus.³⁰ We are not obliged, however, to limit our discussion to literary references; vessels of moderate size and of exceptionally clear crystal have survived from the Roman period: a two-handled cup of smooth contours in Cologne, one of larger size and of different design in Naples, from Santa Maria di Capua, decorated on the body with a naturalistic design of branches and leaves in raised relief, and, largest of all, a kantharos with ring handles and thumb stalls in the Treasury of St. Marks, Venice.³¹

A fragment of an open bowl in the British Museum is all that survives of a vessel originally more splendid than the preceding three. It had figured decoration carved in relief on the exterior; what remains shows a maenad in ecstasy and, above her, a portion of the rim of the vessel with an egg-and-dart pattern.³² The fragment reminds me of the superb kantharos in the Kabul Museum found in 1939 by French excavators at Begram.³³ For years I have wondered whether this object, always considered to be of glass, might not in fact be of rock crystal, for bits of gold leaf still adhere to the relief decoration, a vine branch, and the condition of its surface is pristine. This opinion was reinforced in March 1973 when on a visit to the Warburg Institute in London I had an opportunity to make a close inspection of the original photographs used by Otto Kurz in his publication of the skyphos. Even more recently a new book on the Kabul Museum by Benjamin Rowland with photographs by F. M. Rice has come to



Rock crystal jar in The Museum of Fine Arts, Boston. Height 8.9 cm. Photo courtesy of The Museum of Fine Arts.

my attention. Here it is stated flatly that the vessel is of rock crystal.³⁴

I have not been able to trace a rock crystal situla, or bucket, which belonged in the late eighteenth century to William Ponsonby, the second Earl of Bessborough. This object came to Ponsonby in a roundabout manner from the collection of the Baron Stosch and was first published in 1785.³⁵ The author of the article, Thomas Pownall, was just shy of pronouncing the situla unequivocally an antiquity, yet to judge from his illustration I see no reason to doubt its authenticity.

Nor is anything known of the present whereabouts of the cache of precious objects uncovered on the Esquiline Hill in Rome in 1545, a find which included numerous small sculptures and vases in rock crystal apparently of the first century A.D.³⁶

The story of rock crystal does not, of course, come to a close with the end of the Roman Empire. Vessels continued to be carved in succeeding centuries and, in fact, rock crystal lapidary work reached its heyday during the period of Fatimid rule in Egypt (A.D. 969-1171). Much has been written about surviving examples of these two centuries, magnificent creations which are preserved to us today owing to the fact that they were taken to the West and incorporated into royal and ecclesiastical treasures. That subject, however, lies outside the scope of this discussion.³⁷

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¹Pliny, *Natural History* XXXVII, 23.

²Aristotle, *Meteorologica* 378^a 15 ff.; 389^a 8-9; Theophrastus, *De Lapidibus* I, 1.

³For recent discussions of these theories see D. E. Eichholz's edition of Pliny, *Nat. Hist.*, Loeb Library X (Cambridge, Mass. 1962) x ff.; also his edition of Theophrastus, *De Lapidibus* (Oxford 1965) 16 f.

⁴*De Diversis Artibus* XCIV.

⁵Length 13.5 cm. *Illustrated London News*, February 20, 1954, 259, ill.; G. E. Mylonas, *Ancient Mycenae* (Princeton 1957) figs. 60-61; R. Higgins, *Minoan and Mycenaean Art* (London 1967) 162, fig. 201.

⁶H. 16.5 cm. Cover of *Du* 27 (January 1967); S. Alexiou

et al., *Ancient Crete* (New York 1968) 187, ill.; S. Alexiou, *Guide to the Archaeological Museum of Heraklion* (Athens 1968) 75, pl. 22b; N. Platon, *Zakros* (New York 1971) 136, ill. on p. 139; the lump of rock crystal is illustrated on p. 218. Two fragmentary crystal bowls were found at Knossos in what appear to be MM IIIb contexts (ca. 1650-1550 B.C.); A. Evans, *The Palace of Minos at Knossos* III (London 1930) 409-410, fig. 272; IV, pt. 2 (1935) 930-931, figs. 901 a-b.

⁷Nimet Özgür, "Excavations at Acemhöyük," *Anatolia (Anadolu)* 10 (1966 [1968]) 48, pl. 23, fig. 1 and figs. 4, 5 in the Turkish text. Mention of the discovery of rock crystal at this site is also reported in the following journals: *A.J.A.* 70 (1966) 146; *Anatolian Studies* 16 (1966) 27; *A.J.A.* 71 (1967) 160; *Anat. St.* 17 (1967) 27; *A.J.A.* 73 (1969) 207.

⁸C. M. Firth, "Excavations of the Department of Antiquities at Saqqara, 1930-1931," *Annales du Service des Antiquités de l'Egypte* 31 (1931) 45 ff., especially 47, where mention is made of a rock crystal cup bearing the name Udimu, shown in fig. 2 on the accompanying plate. Udimu was a king of the Ist Dynasty who ruled in the early third millennium B.C.

⁹Brooklyn Museum, acc. no. 37.108 E, H. 6.5 cm., from the collection of Edwin Smith, given by his daughter Miss Leonora S. Smith to the New-York Historical Society in 1907 and transferred to the Brooklyn Museum in 1937. *Catalogue of the Egyptian Antiquities of the New-York Historical Society* (New York 1915) 95, no. 387, "Glass (sic) vase."

¹⁰Ashmolean Museum, acc. no. 1952.57, H. as restored 5.5 cm., diam. as restored 7 cm. M.E.L. Mallowan, "The Excavations at Nimrud, 1951," *Iraq* 14 (1952) 18; *Journal of Glass Studies* 1 (1959) 29f., fig. 8. Through the courtesy of Roger Moorey and Michael Vickers I had an opportunity to handle this object in March 1973.

¹¹E.F. Schmidt, *Persepolis II* (Chicago 1957) 91, pl. 65, figs. 7-11. Omitted from this discussion is the rock crystal phiale with lions in Achaemenian style in the Cincinnati Art Museum, fully published by Helene J. Kantor, "A Rock Crystal Bowl in the Cincinnati Art Museum" in *A Survey of Persian Art* (ed. A.U. Pope) XIV (London and New York 1967), Chap. 78, 2981-2993 (*Proceedings, The IVth International Congress of Iranian Art and Archaeology*, Part A, April 24 - May 3, 1960). I saw the phiale in Cincinnati in December 1971 and at that time was not able to form an opinion as to when the piece was made. Miss Kantor rightly calls attention to the similarity of its shape to the shape of Achaemenid glass phialai, yet on glass vessels of this period nothing so ambitious as animals occurs. The lions are unexpected.

¹²See A. Leo Oppenheim in *Glass and Glassmaking in Ancient Mesopotamia* (Corning 1970) 9-15; also A. von Saltern, *ibid.*, 204.

¹³Acc. nos. 74.51.3599 (the larger, H. 11 cm.) and 74.51.3600 (the smaller, H. 8.2 cm.). L.P. di Cesnola, *A Descriptive Atlas of the Cesnola Collection of Cypriote Antiquities* (New York 1903) III, pl. 75, figs. 1 and 2, respectively.

¹⁴*Catalogue général des antiquités égyptiennes du Musée du Caire*; F.W. von Bissing, *Metallgefaesse* (Cairo 1901) 21, no. 3455, H. 19.7 cm.; no. 3456, H. 14.2 cm.

- ¹⁵Rose quartz jar, Museum of Fine Arts, Boston, acc. no. 21.306, H. 3.5 cm. D. Dunham, *The Royal Cemeteries of Kush, El Kurru* (Cambridge, Mass. 1950) 88, pl. 69, C¹, probably from tomb Ku 53; stone and silver pendant, BMFA acc. no. 24.651, *op. cit.*, 87, no. 1308, fig. 29e on p. 89, from tomb Ku 53. A teardrop-shaped jar of cloudy rock crystal was found in tomb Ku 54, also dated to the second half of the eighth century B.C., BMFA acc. no. 21.2628, H. ca. 7 cm., *op. cit.*, 91, no. 1383, fig. 30c on p. 92 and pl. 38, D.
- ¹⁶Acc. no. 74.51.3598, H. 16.5 cm. L.P. di Cesnola, *Cyprus: Its Ancient Cities, Tombs, and Temples* (New York 1878) 325, ill.; P. Amandry, *Collection Hélène Stathatos* 3 (Strasbourg 1963) 194 and fig. 100; *Metropolitan Museum of Art Bulletin* 31 (1973) 109, where it is illustrated in color.
- ¹⁷Acc. No. 71.126. H. 9.4 cm. Museum purchase. Sale cat. *Christie, Manson & Woods 29-30 June 1898* (Alfred Morrison coll.) lot 289; sale cat. *Christie, Manson & Woods 19 April 1921* (J.P. Heseltine coll.) lot 160; sale cat. *Parke-Bernet 11-14 May 1949* (Joseph Brummer coll.) lot 152, ill. p. 38, where it is said to have been in the collection of R.W.M. Walker, London, 1945; sale cat. *Parke-Bernet 5 Dec. 1969* (Melvin Gutman coll.) lot 145, ill.; sale cat. *Parke-Bernet 5 Nov. 1971*, lot 182, pl. 24. It is also illustrated in the *Allentown Art Museum Bulletin* 18 (1960) 257, no. 163.
- ¹⁸Pliny, *Nat. Hist.* XXXVII, 61 and LXXVI, 200.
- ¹⁹*Ibid.*, XXXVI, 54.
- ²⁰Now in the Museo Civico, Varese. H. 8 cm. A. Frova, "Una Necropoli Romana a Mercallo dei Sassi," *Sibrium* 4 (1958-59) 9 f., figs. 8-10.
- ²¹H.-P. Buehler, *Antike Gefaesse aus Chalcedonen* (Wuerzburg 1966) 61, pl. 2.
- ²²A. Conze, *Altertuemer von Pergamon* I, 2 (Berlin 1913) 293, pl. 57, no. 18.
- ²³Naples, Archaeological Museum, inv. no. 109631, H. 13 cm.; inv. no. 111395, H. 6.5 cm.; V. Spinazzola, *Le arti decorative in Pompei* (Milan 1928) pl. 227, upper right; Frova, *loc. cit. supra*, n. 20, fig. 11: B, C.
- ²⁴A. Maiuri, *La Casa del Menandro e il suo tesoro di argenteria* (Rome 1933) 373, no. 114, fig. 147, left; D. E. Strong, *Greek and Roman Gold and Silver Plate* (London 1966) 154, fig. 31a.
- ²⁵Aquileia: *Fuehrer durch das K.K. Staatsmuseum in Aquileia* (Vienna 1910) 70, ill.; Frova, *loc. cit. supra*, n. 20, fig. 11: C, D; Pula: A. Gnirs, *Pola: Ein Fuehrer durch die antiken Baudenmaeler und Sammlungen* (Vienna 1915) 133, fig. 83; Cologne: F. Fremersdorf, *Die Denkmäler des römischen Koeln VIII*, *Die römischen Glaeser mit Schliff, Bemalung und Goldauflagen aus Koeln* (Berlin 1967) 52, pl. 3, top; Athens: C. Rolley in Amandry, *loc. cit.*, no. 196, pl. 140; Berlin: G. Bruns, *Schatzkammer der Antike* (Berlin 1946) 32, fig. 25a; *Jahrb. d. Institut 65/66* (1950/51) 268, fig. 4; London: H.B. Walters, *Catalogue of the Engraved Gems and Cameos* . . . (London 1926) 375, no. 4027.
- ²⁶Sale cat. *Parke-Bernet 5 Dec. 1969*, lot 146; formerly in the Brummer collection, sale cat. *Parke-Bernet 11 May 1949*, lot 156; and probably identical with a pear-shaped vase in the Forman collection, sale cat. *Sotheby 19-22 June 1899*, lot 489. Compare it with an agate alabastron at Bowdoin College, from the collection of E. P. Warren, acc. no. 1927.22; H.-P. Buehler, *op. cit. supra*, n. 21, 94bis-95, ill.
- ²⁷G. Brusin, *Il Regio Museo Archeologico di Aquileia* (Rome 1936) 55, fig. 48; also A. Frova, "Nuove Scoperte a Mercallo," *Sibrium* 5 (1960) 123 f., figs. 3, 4.
- ²⁸Museum of Fine Arts, acc. no. 99.457, Height 8.9 cm.; sale cat. *Sotheby 19-22 June 1899* (Forman coll.) lot 488; *Museum of Fine Arts, Twenty-fourth Annual Report for the Year ending December 31, 1899*, p. 111, no. 2. Another was in the New York art market, 1969; sale cat. *Parke-Bernet 5 Dec. 1969* (Gutman coll.) lot 147, ill.; first mentioned in the sale catalogue of the Castellani collection, *Cat. Vente Hotel Drouot 12-16 mai 1884*, lot 223.
- ²⁹*Nat. Hist.* XXXVII, 29.
- ³⁰*Roman History* LIV, 23, 1-3.
- ³¹Cologne: F. Fremersdorf, "Ein bergkristall-Becher der fruehesten Kaiserzeit in Koeln," *Festschrift Andreas Rumpf* (Krefeld 1952) 76 f., H. 6.5 cm., Diam. 10.3 cm.; Naples, inv. 124701, acquired 12 December 1898: V. Spinazzola, *op. cit. supra*, n. 23, pl. 22, center of middle row, H. 12 cm.; Venice, Treasury of St. Marks: Fremersdorf, *loc. cit.*, pl. 17, fig. 2; F. Neuburg, *Ancient Glass* (Toronto 1962) fig. 83; H. R. Hahnloser et al., *Il tesoro di San Marco: Il tesoro e il Museo* (Florence 1971) 6, no. 5, pl. 3 (text by W. F. Volbach), Inv. Tesoro 113, H. 20 cm., W. 30 cm.
- ³²C. Davenport, *Cameos* (London 1900) pl. 15, bottom; Walters, *op. cit. supra*, n. 25, 374, no. 4016, ill.
- ³³J. Hackin et al. *Nouvelles recherches archéologiques à Begram, Mémoires de la délégation archéologique française en Afghanistan XI* (Paris 1954) 259, no. 121, figs. 270-273, H. 9 cm., W. 14.4 cm.
- ³⁴F. M. Rice and B. Rowland, *Art in Afghanistan, Objects from the Kabul Museum* (London 1971) 76, no. 75, ill.
- ³⁵T. Pownall, "Observations on a Crystal Vase in the Possession of the Earl of Besborough," *Archaeologia* 7 (1785) 179 ff., pl. 15; A. Deville, *Histoire de l'art de la verrerie dans l'antiquité* (Paris 1873) pl. 19a; A. Kisa, *Das Glas im Altertume* 2 (Leipzig 1908) 673, fig. 277, mentioned on p. 723. Neither Deville nor Kisa made any reference to the object's whereabouts.
- ³⁶*Roem. Mitt.* VIII(1898) 90-92.
- ³⁷A recent and good point of access to the bibliography is the article by D. S. Rice, "A Datable Islamic Rock Crystal" in *Oriental Art*, new series, 2 (1956) 85 ff.