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A GLASS CHALICE OF TUTHMOSIS III

By PERCY E. NEWBERRY, M.A.

THE glass chalice bearing the prenomén of Tuthmosis III figured Plate XVI, below¹, was bought about the year 1825 by an English archaeologist, Edward Dodwell, F.S.A., who was then living in Rome and forming the well-known collection of Egyptian, Greek and Etruscan antiquities which, some years after his death in 1832, passed into the possession of Munich and is now preserved in the Antiquarium of that city. In a catalogue² of the collection printed at Rome in 1837, the chalice is thus described: "Calice di smalto turchino³ chiaro con ornamenti gialli e turchinoscuri; sul corpo v'è il cartello del Thutmose IV [*sic*] della dinastia XVIII (a. 0.4 e un quart. dia. 0.3)." It will be noticed that the chalice is here called "smalto" (enamel), and in the last "Guide"⁴ to the Antiquarium it is said to be of "faience." It is, however, of glass, and glass of a kind that was much prized in Upper Egypt from the Eighteenth to the Twenty-first Dynasty.

About fifty perfect, or nearly perfect, examples of this type of glass are known, and I have seen and noted fragments of at least two hundred and fifty broken ones. A certain number of specimens are dated by the names of the kings for whom they were made being worked into, or cut on, the glass. Besides the Dodwell chalice mentioned above there is a bottle in the British Museum⁵ of opaque turquoise blue glass with ornamentation in yellow, which bears the prenomén of Tuthmosis III. A dozen pieces bear the names of Amenophis II⁶, Amenophis III⁷ and Akhenaton⁸. The date of other specimens or fragments can be determined from their provenance. In the tomb of Maḥerpre, which dates from the reign of Tuthmosis III, was found a bottle⁹ of dark blue glass with ornamentation in green,

¹ The Plate is reproduced from a drawing made by Dodwell in 1825 or 1826. This drawing is preserved among the Dodwell Papers in the Manuscript Department of the British Museum (*Add. MS.* 33,958, f. 43).

² *Notice sur le musée Dodwell et catalogue raisonné des objets qu'il contient*, Rome, 1837. This catalogue was written by Dr Braun and contains an introduction by Bunsen.

³ VON BISSING (*Rev. Arch.*, Vol. XI, p. 213) says that it is of "verdâtre" glass and that the decoration was in "jaunes et noirs," but the chalice is discoloured. The body glass was originally blue and the ornamentation yellow and dark blue, as it is correctly described in the catalogue of 1837. The chalice is figured in colour by ROSELLINI, *Mon. Civili*, Pl. LXIIb and a photograph of it is given by KISA, *Das Glas im Altertum*, 1908, Vol. I, p. 17.

⁴ CHRIST-DYROFF, *Führer durch das Antiquarium*, p. 117, no. 630.

⁵ Figured in WILKINSON, *Manners and Customs of the Ancient Egyptians* (ed. BIRCH), Vol. II, p. 140, no. 382.

⁶ Some of these pieces are figured by DARESSY, *Fouilles de la vallée des Rois*, in the *Cat. gén.* of the Cairo Museum, nos. 24753, 24794 and 24804. Other examples nos. 24798, 24800-2 and 24816 are described in the Catalogue. I secured at Thebes two pieces, probably from the tomb of the king, with the prenomén of Amenophis II worked into the glass.

⁷ From notes of fragments in dealer's hands.

⁸ PETRIE, *Tell el Amarna*, Pl. XIII.

⁹ DARESSY, *op. cit.*, no. 24059.

I

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1. PENDANT OF GLASS MOSAIC FOUND AT DAHSHÛR
(Twice the size of the original)
 2. GLASS VASE OF TUTHMOSIS III IN THE MUNICH ANTIQUARIUM
- From water-colour drawings

white and yellow. Fragments of a large number of vases of different forms, and of cups, dishes and bracelets of similar glass were discovered in the tombs of Amenophis II¹ and Tuthmosis IV². Pieces of at least a hundred vases and scores of amulets, ear-rings and broken bracelets have been brought to light among the ruins of the palace of Amenophis III at Thebes³; and near by was discovered the earliest known glass factory, in which were found small crucibles containing dark blue glass and a quantity of different coloured rods of the same material⁴. Three or four similar factories of the time of Akhenaton were found at El-Amarna⁵, and hundreds of fragments of vases, bracelets, ear-rings and amulets have been collected in the ruins of Akhetaton⁶. A perfect bottle of the time of Amenophis III⁷, another bottle that can be dated to the reign of Tutankhamūn⁸, and a bowl and several bottles of the reign of Ramesses II⁹, have all been found in tombs at Gurob. At Lisht¹⁰ there were extensive factories of this glass dating from the Twentieth Dynasty, and the site of another factory of about the same date was shown to me by Arabs on the east bank of the Nile a short distance south of Menshiyeh¹¹. To the Twenty-first Dynasty belong the famous cups of Nesikhonsu in the Cairo Museum¹².

A considerable number of similar glass vases have also been found outside Egypt, in Cyprus and other places of the Mediterranean. Fine examples were obtained from the tombs of Enkomi and Curium, and these are undoubtedly the work of Egyptian craftsmen of the period between 1450 and 1200 B.C. A very remarkable cup is recorded from Curium (tomb No. 89). This is figured in MURRAY, *Excavations in Cyprus*, p. 69, fig. 99. It has a high tapering bowl and foot, and is decorated in a calyx-pattern of alternating blue and yellow opaque glass with dark brown vandyke pattern round the top. The pomegranate-shaped vases from Enkomi (*op. cit.*, p. 34, No. 1218 and p. 35, Nos. 1052, 1053, 1056) are precisely similar to specimens found in Egypt that appear to be not later than the Eighteenth Dynasty. In the tomb where these pomegranate-shaped vases were found were also unearthed a green faience bowl of Egyptian manufacture and an arragonite (?) vase (*op. cit.*,

¹ DARESSY, *op. cit.*, nos. 24753—24838. A glass vase is figured in the tomb of Rēʿ at Thebes (no. 72 of GARDINER and WEIGALL, *Topographical Catalogue*), see LEPS., *Denkm.*, Part III, Pl. 62.

² CARTER and NEWBERRY, *Tomb of Thoutmōsis IV*, pp. 135—142, with Pl. XXVII.

³ A small series of fragments is in the Victoria and Albert Museum, South Kensington. Larger series are in the Amherst and my own collection. In DAVIS and NEWBERRY's *Tomb of Iouiya and Touiyou*, Pl. XXVII, are figured two dummy vases found in the tomb of the parents of Queen Thyi; these are made of wood and are painted to represent glass. One represents a dark blue glass with yellow wave lines; the other also represents dark blue glass and has yellow wave lines and rosettes.

⁴ Notes made by me in 1902—3, when Mr Tytus and I were digging at this site.

⁵ PETRIE, *Tell el Amarna*, pp. 25—27, Pl. XIII, where are figured the fritting-pans, glass rods etc., used in the manufacture of the glass.

⁶ Some of these pieces are preserved at University College, London, and others are in the Amherst Collection. I also possess a few typical pieces from this site.

⁷ J. E. QUIBELL, *Annales du Service des Antiquités*, Vol. II, Pl. I, with p. 4.

⁸ PETRIE, *Illahun, Kahun and Gurob*, Pl. XVII.

⁹ *Op. cit.*, Pl. XVIII.

¹⁰ A. C. MACE, *The Murch Collection*, in the Supplement to the *Bulletin of the Metropolitan Museum of Art*, January 1911, pp. 24—26.

¹¹ This had already been completely plundered when I was taken there in 1911. I picked up some glass slag and a few rods of coloured glass and was told by the natives that several vases from the site had been sold during the previous season to Luxor dealers. Some of these vases were bought by the late Mr Theodore Davis.

¹² MASPERO, *Les momies royales de Déir el Bahari*, Pl. XXII, A.

TURQUOISE-BLUE GLASS BOWL IN THE COLLECTION OF
THE EARL OF CARNARVON

p. 35, fig. 1048) of the same form¹ as the glass bowl in Lord Carnarvon's collection which is figured in Plate XVII. This latter bowl was found in Upper Egypt in 1856²; it is of brilliant turquoise blue translucent glass, and is certainly the most beautiful example of a self-coloured Egyptian glass vase that has yet been found. I should be inclined to date it to the reign of Amenophis III, but it may possibly be a little earlier.

The shapes of these vases are nearly all derived from well-known alabaster or pottery forms. In size they range from 1½ inches to 16 inches in height. The colours employed are very varied and all appear to be due to metallic oxides. For the body-colour, blue is the commonest; it occurs in all shades from pale turquoise to deep lapis-lazuli and violet. Pale or dark plum colour comes next, then opaque white, green, yellow, and black; red and brown are very rarely found as a body-colour. Four vases are known of a pale greeny-white, but not a single example is known of anything approaching clear transparent colourless glass. The ornamentation usually consists of wavy or zigzag lines of a colour different from the body glass. Thus on a dark blue ground white, turquoise blue, yellow, green or red is used; on a turquoise blue ground, dark blue, yellow or white. Sometimes the body glass is ornamented with circular discs³, or with bosses⁴, of glass of different colours. In one specimen⁵ are sprays of foliage round the bowl and coat-of-mail pattern round the neck. Sometimes rosettes⁶ of different colours are employed, or bands of flattened rods⁷ of different colours, or plain crosses⁸.

The process of manufacture of these vases can be made out from an examination of the contents of the factories that have been found and by a study of the fragments that we possess. It was a very elaborate process⁹, which necessitated constant annealing of the glass and the exercise of the greatest care to prevent the furnace attaining a temperature at which the glass would run. Whether the glass itself was made at any of the factories in Upper Egypt is doubtful; it is more probable that it was brought in the form of ingots¹⁰ from glass works in the north-western Delta, where the necessary materials for glass-making are to be found¹¹. These ingots were broken up into small fragments and put into crucibles or fritting-pans that were placed on inverted cups in the glass-worker's oven¹². The glass

¹ Arragonite bowls of this shape are well known from Egypt. One was figured in a recent number of this *Journal* (vol. v, Pl. XXVI, pp. 167—168).

² It was brought to England in that year by the late Mr Hood of Nettleham Hall, Lincoln.

³ Fragment from the palace of Amenophis III in my own collection.

⁴ A dark blue glass bottle in the Liverpool Museum.

⁵ This is the Tuthmosis III bottle in the British Museum.

⁶ See for example DARESSY, *op. cit.*, Pl. XLIII, no. 24761 and another form of rosette is figured in DAVIS and NEWBERRY, *Tomb of Iouiya and Touiyou*, Pl. XXVII.

⁷ Fragment from the tomb of Amenophis II in my own collection.

⁸ DARESSY, *op. cit.*, no. 24761.

⁹ I discussed this subject in 1910 with Mr William Burton of Messrs Pilkington's works near Manchester, and he agreed with the method of manufacture as here described. Much the same method of procedure is given by Petrie in *Tell el Amarna*, pp. 25—27, and in the *Catalogue of the Burlington Fine Arts Club. Exhibition of the Art of Ancient Egypt*, London, 1895, p. xxv. Mr H. J. Powell of the Whitefriars' Glass Works, with whom I had earlier discussed the subject, believed that all the Egyptian vases were blown; see his article on "Glass" in the eleventh edition of the *Encyclopædia Britannica*, 1910.

¹⁰ I have seen four of these ingots; one of a beautiful turquoise blue colour is in Lord Carnarvon's collection at Highclere Castle, and another of a similar colour is in the Metropolitan Museum of Art at New York. The other two specimens I saw in an antiquity dealer's hands in Cairo in 1904; these were of red colour.

¹¹ See below, pp. 159—60.

¹² PETRIE, *Tell el Amarna*, p. 26, Pl. XIII.

was then fired, and when sufficiently soft the viscid glass was picked out by means of metal pincers and rolled into thin rods or tubes¹. These rods were then annealed and coiled round a sandy clay core² into which a metal rod had been inserted, the metal rod being the handle by which the glass-worker held the vase. When a sufficient number of rods had been wound round the core for the bowl, and the metal rod for the neck, to make the glass coat or "body" of the required thickness, the whole was put into the oven and fired up to a heat sufficient to coalesce the rods but not great enough to cause the glass to run. The foot was modelled by a metal tool out of a separate piece of glass and attached to the bowl while the glass was still soft. The vase was then annealed again to enable the worker to wind round it rods of different coloured glass to form the ornamentation. When the rods had been placed in position on the surface, the vase was again placed in the oven until the whole of the glass was soft enough to allow of the rods being rolled into the body. It should be noted here that these coloured rods are always *embedded* in the body of the glass and never go through it as in mosaic or cane glass. Metal pins³ were then placed at intervals around the vase to hold the rods in place, while the surface between the pins was rapidly dragged up or down in such a way as to produce wavy or zigzag patterns. The hieroglyphs, rosettes, crosses, and other forms of decoration were placed on the surface and embedded in the same way. When the ornamentation was completed the surface was rubbed down⁴ with emery, or some other cutting material, to remove any surface imperfections. The vase was finally put into the oven for just sufficient time to make its surface vitreous⁵ and allow of the rims around the neck, feet and the handle or handles to be added. The vase and metal rod by which it had been held during the process of building up were then set aside to cool, and when quite cold the metal rod, which would then have contracted free of the glass, was removed. The final process was scraping away the sandy core from the inside, and the result was the finished glass vase.

The technique displayed in the manufacture of these vases is so elaborate, the quality of the glass so fine, and the colours so brilliant, that it is certain the craftsmen who made them had long passed the primitive or experimental stage of glass-making. They reveal the art in a high state of proficiency; they must be the outcome of a long series of experiments. Very little, however, is known about the early history of glass. The earliest factory that has been found in Egypt is one dating from the reign of Amenophis III at Thebes, but, as we have seen, some specimens of the kind of glass that we have been discussing date from three reigns earlier than Amenophis III, and the earlier specimens are of perfect workmanship. It has been suggested that, although these glass vessels were made in Egypt, they were the handiwork of foreign craftsmen and that the industry originated in Syria, not Egypt. But there is no real evidence to support this theory. No specimen of glass has been found in Syria that can be attributed to so early a date as Tuthmosis III.

¹ PETRIE, *op. cit.*, Pl. XIII.

² Every fragment shows the rough inner surface with sand adhering. The necks have invariably the marks of the metal rods. It is, I believe, only by this method of coiling that a uniform thickness for the "body"-glass can be obtained. At Tell el-Amarna the usual method of bead-making was by winding a thin thread of drawn glass around a thin rod of metal, and these metal rods were actually found with the threads still stuck on them. See PETRIE, *Tell el Amarna*, Pl. XIII, 59—61.

³ I have seen a few specimens in which traces of these metal pins can still be seen.

⁴ Mr Howard Carter pointed out to me that on the surface of some of the vases tiny air-bubbles often appear which have been cut across.

⁵ This is obvious from many specimens.

On the other hand no trace of more primitive forms of this particular kind of glass have been found in Egypt. It is true that this style of glass descended into Greek times and was largely used throughout the Mediterranean; it is generally termed "Phoenician Glass," but Phoenicia was the adopted, not the native, country of glass-making¹. All the so-called "Phoenician" specimens are very much coarser and possess none of the brilliancy and vitreous surface that mark the earlier products. That glass-making was a very ancient industry in Egypt is beyond question; its history can indeed be traced back to prehistoric times, for glass beads have been found in prehistoric graves. Pieces of semi-transparent blue glass used for inlaying on wood and dating from the First Dynasty were found by Amélineau² at Abydos, and among the jewels of King Zer's queen occur plaques of turquoise blue glass³ of excellent quality. From the Twelfth Dynasty we have two well-authenticated pieces of glass mosaic. One of these is a circular disc in the centre of which is a figure of a white ox with black spots; this is set in a ground of pale blue and surrounded by a band of red and white rectangles, outside which is a border of pale blue. It is covered with a thin disc of fluor-spar and mounted in a circular frame of granulated gold work. This exquisite pendant was found by de Morgan⁴ at Dahshûr among the jewels of one of Amenemmes II's princesses. It is described by de Morgan as being made of different coloured stones, but I examined it some years ago with a magnifying glass and am convinced that it is made of glass. The late Mr Harold Jones, who made a water-colour drawing of it for me (see Plate XVI, at top), was of the same conviction, and Sir Gaston Maspero in one of his last works⁵ definitely describes it as "glass mosaic." The second piece of glass mosaic dating from the Twelfth Dynasty is a rod in the Berlin Museum⁶ which gives the cartouches of Amenemmes III in white on a black ground. That it is contemporary with the king whose name it bears appears to me certain. Von Bissing⁷ attributed it to the Roman age because he was not aware of any early mosaic glass. In my own collection I have several pieces from the palace of Amenophis III, and we cannot doubt that this kind of glass was well known in Egypt at the time of the Eighteenth Dynasty. The Egyptians were also expert cutters and engravers of glass as early as the Intermediate period between the Twelfth and the Eighteenth Dynasties. There is a small piece of opaque blue glass which has a lion's head cut on one side of it and on the other side is engraved the prenomen of Intef Nubkheperre. This specimen is in the Slade Collection of the British Museum⁸. Many specimens of engraved glass are known from the Eighteenth Dynasty⁹.

I have remarked above that the earliest known glass factory in Egypt is not older than the reign of Amenophis III, but that the history of the industry goes back to very much earlier times. Egyptian glass is a lime soda silicate and all the materials for making it are to be found in the north-western Delta. It was here in later times that most of the

¹ PERROT and CHAPIEZ, *Hist. de l'Art dans l'antiquité*, Vol. III, Phœnice-Chypre, pp. 732 ff.

² Now in the Ashmolean Museum at Oxford.

³ E. VERNIER, *La Bijouterie et la Joaillerie Égyptiennes*, p. 84, n. 2, cf. p. 26.

⁴ J. DE MORGAN, *Fouilles à Dahchour*, Vol. II, Pl. XII, no. 62, p. 67.

⁵ *Art in Egypt* (Ars Una Series), 1912, p. 120.

⁶ *Ämtliche Berichte aus den Kgl. Kunstsammlungen*, Nov. 1907, pp. 53—54.

⁷ *Arch. Rev.*, Vol. XI, p. 211.

⁸ A. NESBITT, *Glass* (S. K. Mus. Art Handbook), p. 10.

⁹ Several engraved pieces were found in the tomb of Amenophis II, in the palace of Amenophis III and at Tell el-Amarna.

glass exported from Egypt to Rome¹ was made. There are remains of extensive glass works in the Wady Natrûn and to the south and south-west of Lake Mareotis². Hadrian, in a letter addressed to the consul Servianus, mentions glass-making as one of the chief industrial occupations of the people of Alexandria. Strabo³ tells us that he heard from Alexandrian glass-workers that there is in Egypt a kind of vitrifiable earth, without which expensive works in glass of various colours could not be executed. The Egyptian name of glass is very significant in this connection. It is *ṭhn · t*. Just as we use the word *ṭhn · t* "china" for a kind of porcelain which first came to us from China, so the Egyptians called glass *ṭhn · t* after the country (*ṭhn · w*) of the north-western Delta from which we may presume they derived it.

¹ Cicero, *pro Rab. Post.*, 14. Alexandria sustained its reputation for its glass for many centuries. Martial XI, 11 : XII, 74 : XIV, 115. Vopisc., *Aurel.*, 45.

² WILKINSON, *Modern Egypt and Thebes*, 1843, Vol. I, pp. 384, 394 and see note 8 to RAWLINSON'S *Herodotus*, II, 44. I have myself noted the sites of two factories to the south and south-west of Lake Mareotis.

³ Strabo, XVI, 11, 25.

ERRATUM

Page 160, lines 7—8; read “Just as we use the word “china” for a kind of porcelain...”