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SOME BLOWN "THREE-MOLD" SUSPICIONS CONFIRMED

DWIGHT P. LANMON, ROBERT H. BRILL AND GEORGE J. REILLY

THE existence of some remarkable blown "three-mold" vessels of amethyst and blue glass was first announced to collectors and scholars in 1941.[1] For the first time, George S. and Helen McKearin published a noteworthy group which consisted of a pitcher, two covered sugar bowls, a decanter and stopper, and a tumbler, patterned in three different designs classified as numbers GIII-5 (a quart-size mold), GIII-6 (a pint-size mold), and GII-18 (a stopper mold).[2] Several of the pieces were said to be from a table set which had originally consisted of at least eight amethyst pieces: two sugar bowls, two cream jugs, a decanter, a quart pitcher (Fig. 1), and tumblers of two sizes.[3] A history of ownership in one family was attributed to the pieces. They were thought to have been made by Frederick Mutzer or his son Gottlieb, ancestors of the owner. Frederick Mutzer had emigrated from Germany to the United States in the early nineteenth century and worked as a glass blower. His descendants were also employed by the glassmaking industry in and around the Philadelphia area.[4]

Despite the lack of evidence that Mutzer ever worked there, these newly-discovered pieces and others which may reasonably be associated with the "Mutzer group" have usually been attributed to the New England area, and even to the Boston and Sandwich Glass Company at Sandwich, Massachusetts. These attributions are based upon the knowledge that vessels with similar decora-

1. George S. and Helen McKearin, *American Glass* (New York: Crown Publishers, 1941), Plate 125.

2. *Ibid.*, pp. 251 (Plate 88) and 254 (Plate 92).

3. Letter, Mrs. George Mutzer, Wildwood, New Jersey, to Roland Whilden, n.d. [1934], Archives of The Corning Museum of Glass.

4. Affidavit of George Mutzer, Wildwood, New Jersey, 19 October 1934; Memorandum of a visit with George Mutzer, by George S. McKearin, 12 August 1937 (both in Archives of The Corning Museum of Glass); George S. McKearin, "From Family Glass Cupboards," *Antiques, LIX*, no. 2 (February, 1951), pp. 131-133, and frontis.

In the affidavit, Mutzer states that the glass was made by Gottlieb Mutzer, his *grandfather*, at Medford, New Jersey, "about Sixty five or Seventy years ago" [which would place the date of manufacture around 1854 to 1859]. In the memorandum, Mutzer states that the glass was made by his *grandfather*, Frederick Mutzer, not his *father*, "Gultlieb."

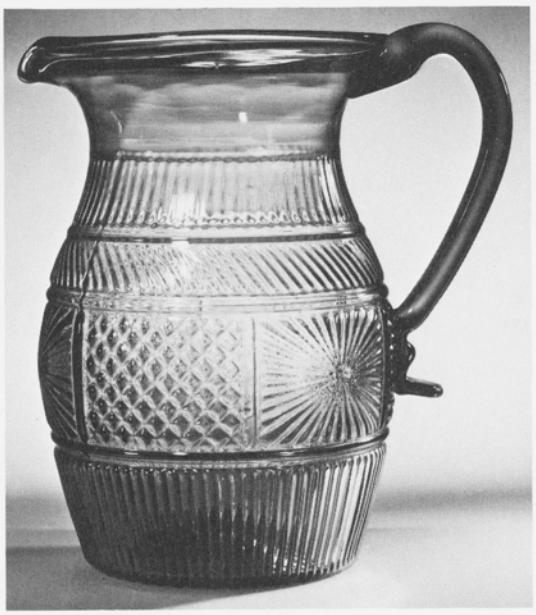

FIG. 1. *Amethyst pitcher, pattern G III-5, "Mutzer group." (Photo: The Corning Museum of Glass)*

FIG. 2. *Green pitcher, pattern G III-5, Clevenger factory, Clayton, New Jersey, ca. 1927-50. (Photo: The Corning Museum of Glass)*

tive patterns were made there in the early nineteenth century. Fragments of glass in similar colors (blue, amethyst and light green, in addition to colorless) have been found at the Sandwich factory site.

From the first appearance of these items there has been a low but constant murmur of disbelief regarding their authenticity.[5] Many students have suggested that they may have been made in the twentieth century at the Clevenger factory, which was located at Clayton, New Jersey, not far from the home of the Mutzers. This theory is based on the similarity of the GIII-5 and GII-18 patterns used on both the Mutzer and Clevenger groups.

The suggestion that the two groups were patterned in the same molds is indefensible. Specific features of the designs are different. A typical Clevenger pitcher is illustrated in Fig. 2. A comparison of the panels of diamond diapering illustrates the difference between the molding on the two pieces (Fig. 3a and 3b). Comparison of the forms and details (such as handles and spouts) also demonstrates that they are from two different "hands." Thus, it is unlikely that the Mutzer glasses were made at the Clevenger factory, even if two different sets of molds were available: one for the Mutzer group, the other for "production" wares. Moreover, the material used in the production of the two groups is entirely different. All pieces in the Mutzer group are of lead glass whereas Clevenger pieces are apparently never of lead glass. Also, the GIII-6 pattern is not

5. McKearin, "From Family Glass Cupboards," pp. 132-133. Various scholars have suggested that a number of pieces associated with this group are spurious. In the 1960's, Paul N. Perrot, then Director of The Corning Museum of Glass, removed several pieces from exhibition, questioning their authenticity. Kenneth M. Wilson, then Chief Curator at Corning, has also independently questioned their authenticity. Because conclusive arguments to support these feelings were not found to overcome other scholars' confidence, they were again placed on exhibition. Correspondence between Henry Francis du Pont and Neil C. Gest, of Mechanicsburg, Ohio (who sold Mr. du Pont a number of pieces of American glass), also evidences a distrust of many (if not all) of the pieces in this group.

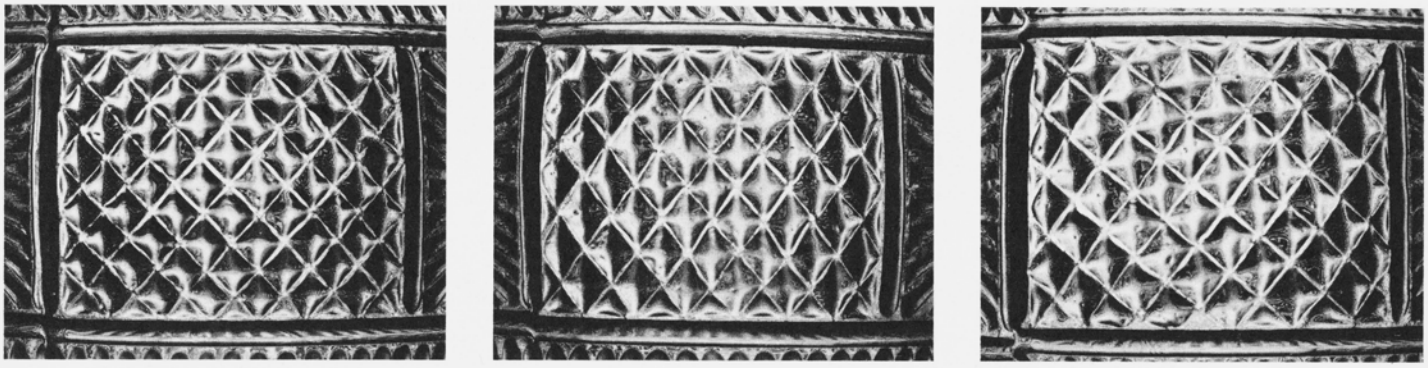

FIG. 3a. *Close-up of three panels of diamond-diaper molding, Clevenger factory, Clayton, New Jersey. (Photo: The Henry Francis du Pont Winterthur Museum)*

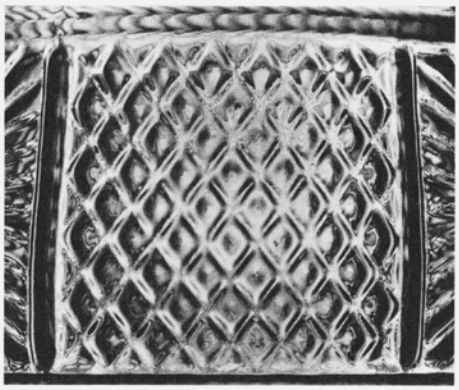

FIG. 3b. *Close-up of a panel of diamond-diaper molding, "Mutzer group," pattern G III-5. (Photo: The Henry Francis du Pont Winterthur Museum)*

known to have been used by the Clevengers. We must look elsewhere for the origin of this intriguing group.

Histories of ownership can be extremely helpful in this search. Attributions, even tentative, may convincingly be argued when large numbers of related vessels survive in areas known to have had glass factories and when the forms of those vessels are sufficiently uniform. Unfortunately, an examination of the histories of the pieces related to the Mutzer group is unrewarding. No pieces, other than the set owned by the Mutzer family have come to light with any specific histories of ownership. This is surprising since nearly fifty related pieces have now been located.

Glassware purchased without documented history of ownership may also inadvertently reveal a manufacturing source. If many related pieces are found in a limited area, from dealers not specializing in antique glass, it may be argued that the ware was probably used and possibly made locally. This evidence is, of course, much less precise than documented ownership and must be treated with extreme caution. In the glasses under consideration a few pieces are known to have come from such sources in southeastern Pennsylvania and southern New Jersey. None are definitely known to have been found in New England and there is no documented evidence of their having been used there. Unless a New England factory was unusually efficient at trading away all of the wares which were patterned in a limited group of molds, we may assume that they were made in another area, possibly Pennsylvania or New Jersey. Obviously, this conclusion is tentative.

The earliest date yet associated with any of these specimens (that is, the date when they are first recorded in a collection) is 1929.[6] In that year an amethyst cream jug

6. Neil Gest, in a checklist prepared in 1945 of the collection of Mr. Henry Francis du Pont, states that he purchased an amethyst salt dish in Mr. du Pont's collection (listed in the catalogue in this report, *GII-18*, no. II.A.) in 1928.

Fig. 4a. *Colorless pitcher, pattern G III-5, poss. Boston and Sandwich Glass Company, Sandwich, Massachusetts, ca. 1820-40. (Photo: The Henry Francis du Pont Winterthur Museum)*

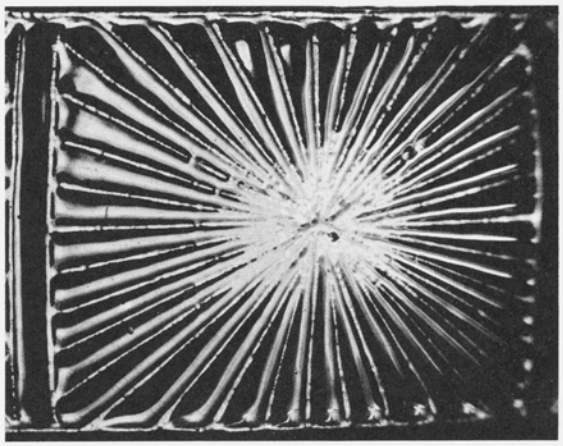

Fig. 4b. *Close-up of a panel of sunburst molding, "non-Mutzer group," pattern G III-5 (Photo: The Henry Francis du Pont Winterthur Museum)*

(Fig. 6a), patterned in a GIII-6 mold, was acquired by Henry Francis du Pont. By 1933, when his collection was examined by the McKearins, Mr. du Pont owned at least four pieces from this group.[7] The pieces owned by the Mutzer family were purchased by the McKearins in 1934.[8]

The total number of pieces which have been associated in this group is over fifty, including lids and stoppers. All have been examined and identified by one of the authors (DPL). Undoubtedly, there are many other pieces which belong to this group, but they have not yet been identified. It is the purpose of this article to examine the range of objects which are known to exist within this group and to speculate upon their origin and age. Accordingly, this group, made up of pieces which belonged to the Mutzers and those which may be related to them will be referred to as the "Mutzer group." An illustrated catalogue of all identified forms may be found at the end of the article.

7. Letter, Helen McKearin Powers to Henry Francis du Pont, December 18, 1934 [archives of The Henry Francis du Pont Winterthur Museum].

8. McKearin, "From Family Glass Cupboards," p. 132.

All of these pieces were patterned in three-part, full-size molds. By carefully examining the molded decoration, one can identify pieces which were patterned in the same mold. The number of individual elements (such as the number of ribs or diamonds) may be duplicated in more than one mold, but each mold becomes unique as scratches or dents deface the interior. These defects are transmitted to the objects patterned within the mold, along with the decoration. One has only to catalogue these defects to identify the mold used. All defects will not necessarily occur on every piece; a defect may occur during use, after a number of objects are already completed. The interiors of molds may also be changed or cleaned, further complicating this avenue of study.

Many pieces of three-mold glass decorated in the GIII-5 pattern were made in molds which were in poor condition. The pitcher illustrated in Fig. 4a is typical of pieces patterned in molds which may be characterized by a number of specific defects. A close-up of one sunburst panel is shown in Fig. 4b. A vertical scratch in the mold

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Fig. 5a

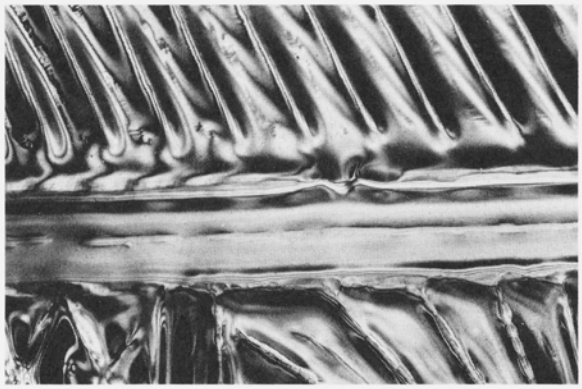

Fig. 5b

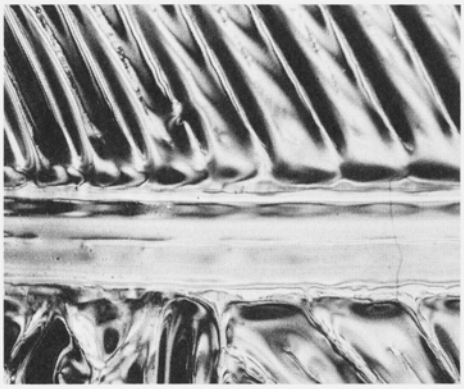

Fig. 5c

Fig. 5a. *Colorless celery vase, pattern G III-5, "Mutzer group;" area outlined above, left, illustrated in Fig. 5b; area outlined above, right, illustrated in Fig. 5c. (Photo: The Henry Francis du Pont Winterthur Museum)*

Fig. 5b. *Close-up of mold defect, pattern G III-5, "Mutzer group." (Photo: The Henry Francis du Pont Winterthur Museum)*

Fig. 5c. *Close-up of mold defect, pattern G III-5, "Mutzer group." (Photo: The Henry Francis du Pont Winterthur Museum)*

traverses the rays at the left of the sunburst field; smaller scratches are also apparent throughout the design. The long scratch is present on each of the sunburst panels, but it is obvious that this feature was not intended as decoration. It is probable that each part of the mold was cast from a defective master mold. Many of the smaller scratches appear in only one panel and undoubtedly occurred after the mold was completed.

The character of the GIII-5 mold used in the manufacture of the Mutzer group of glass is very different. Although the decoration on the celery vase illustrated in Fig. 5a is ostensibly similar to that on the pitcher, close examination of the sunburst panels reveals none of the scratches illustrated in Fig. 4b. Although the mold used to produce the decorative pattern on the pitcher is characterized by a multitude of scratches, the one used for the decoration of the Mutzer group is noteworthy for its lack of scratches. In fact, only two scratches have been found which characterized this mold (Fig. 5b and 5c). They appear as short, convex lines which connect adjacent ribs. These marks occur only once, each, in the design. Thus, it is apparent that the mold was defective, not the master (if a master were used at all) from which the three sections were cast.

The mold used to impart the GIII-6 pattern in the Mutzer group was also in excellent condition. No major defects are found in the design, although several smaller ones may be identified. One, which may be used to identify objects patterned in this mold, can be seen in a sunburst panel on the pitcher illustrated in Fig. 6a. There is a slight defect between two adjacent rays which creates the dimple-like effect seen at the bottom left of Fig. 6b.

The mold used to produce stoppers of pattern GII-18 (Fig. 7) was equally sharp. No specific defects have been noted in this pattern, unlike the multitude of scratches which characterize stoppers patterned in other GII-18 molds. Identification of objects made in this mold rests upon the correlation of specific design details and form, and upon the similarity of the quality of the glass used

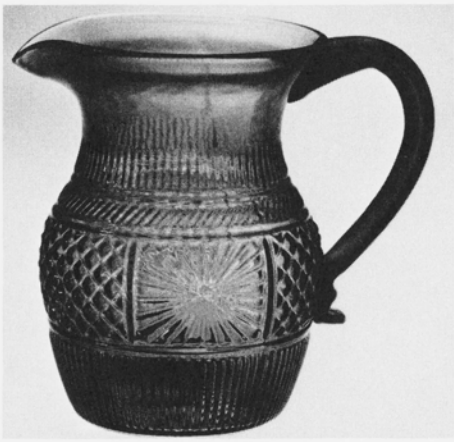

FIG. 6a. *Amethyst cream jug, pattern G III-6, "Mutzer group." (Photo: The Henry Francis du Pont Winterthur Museum)*

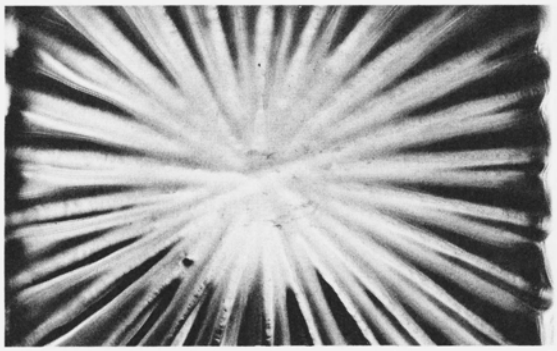

FIG. 6b. *Close-up of a panel of sunburst molding, "Mutzer group," pattern G III-6. (Photo: The Henry Francis du Pont Winterthur Museum)*

FIG. 7. *Blue stopper, pattern G II-18, "Mutzer group." (Photo: The Henry Francis du Pont Winterthur Museum)*

in their production. A tabulation of the individual decorative elements in this and the two other patterns is included in the catalogue which follows this article.

It should be emphasized that not all objects in these patterns (GIII-5, GIII-6 and GII-18) were made in these specific molds, nor do the conclusions about the age and origin of this group necessarily apply to pieces patterned in other molds. In addition, these three patterns may not have been the only ones used by the factory responsible for the Mutzer group. The number of molds associated with that factory may become larger. This article is concerned only with the specific group of objects patterned in the molds which may be identified by the defects discussed earlier.

It is important to this study to prove that these glasses were made at a single glasshouse. To accomplish this it is necessary to prove both that these three molds were used in a single glasshouse and that they were used concurrently. The second part of this thesis is the more easily proved. The sugar bowls in this group were patterned in the identified GIII-5 mold, as were the decanters; the lids on the sugar bowls were patterned in the GIII-6 mold; the decanter stoppers were produced in the GII-18 mold. Thus, we may be certain that all of these molds were used together, at least once. We have not yet, however, proved that they were used in only one glasshouse. Molds were expensive and may often have been purchased from defunct glasshouses by other manufacturers. It is not known how frequently such practices occurred but the possibility must always be considered in the study of molded wares. It is necessary to turn to the glasses themselves to answer this important part of the thesis.

Related forms within this group exhibit obvious similarities of detail. The quart pitcher (Fig. 1) and pint cream jug (Fig. 6a)

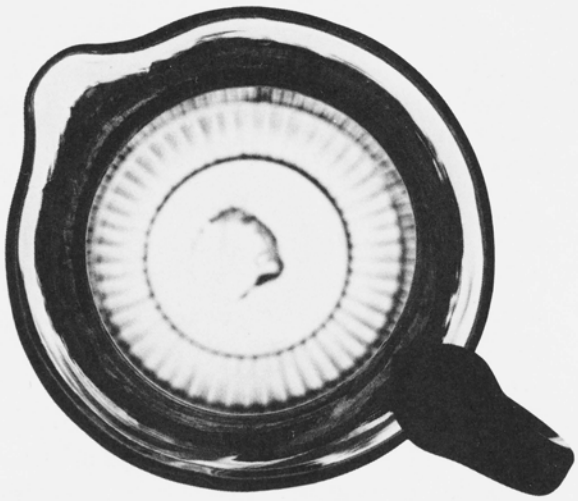

FIG. 8. *Top view of a "Mutzer group" cream jug, pattern G III-6. (Photo: The Henry Francis du Pont Winterthur Museum)*

FIG. 10. *Blue bowl, pattern G III-6, "Mutzer group," illustrating overlap on body, stem and foot. (Photo: The Henry Francis du Pont Winterthur Museum)*

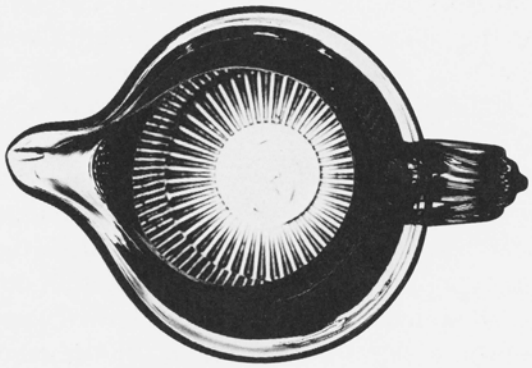

FIG. 9. *Top view of the pitcher illustrated in Fig. 4a. (Photo: The Henry Francis du Pont Winterthur Museum)*

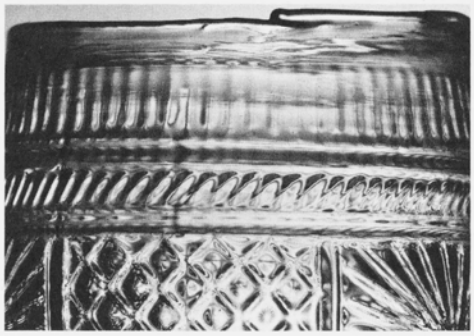

FIG. 11. *Close-up of the rim of a tumbler (illustrated in Fig. 29), pattern G III-6, "Mutzer group." (Photo: The Henry Francis du Pont Winterthur Museum)*

demonstrate uniformity of design. In both cases the handles are poorly formed and are of weak construction: the upper terminals are small, as are the lower ones; the latter are crimped only once and sometimes not at all; the end is sometimes turned out at right angles to the body; the handles are of circular cross-section, are thin, and are curved in rather crude, graceless arcs. Compare these with the handle on the pitcher illustrated in Fig. 4a, which does not belong to the Mutzer group. There, the heavy, ribbed handle has substantially larger upper and lower terminals; the lower terminal is also elaborately crimped. The spouts on Mutzer pitchers are only summarily formed and barely interrupt the lips. They do not alter the circular form of the rim to any great degree (Fig. 8). Conversely, the spout on the pitcher illustrated in Fig. 4a is boldly conceived and draws the neck into a pear shape, as viewed from above (Fig. 9).

Other characteristics of form in the Mutzer group emerge upon careful examination. Difficulty was experienced in the constriction of necks and stems, which often have overlapped sections and a contorted cross-section (Fig. 10). Rims are sometimes sheared in a spiral and small tips of glass are left to project disconcertingly above them (Fig. 11); applied stems have flattened-ball knops, and the feet are thick and conical. Drawn feet are common; they are found on decanters, pitchers, salt dishes, and bowls. (Drawn-footed forms are otherwise distinct rarities in three-mold glass.) In addition, all are made of lead glass of consistently fine quality—extraordinarily so, if an early nineteenth-century date is proposed. Further, there are few irregularities in the glass, such as seeds or stones, but when they are present, they are often of unusually large size (Fig. 10). The colors are brilliant. Three visually different tints of amethyst glass have so far been identified; there are two of blue glass and one of yellow-green. The consistency with which these features of form and material are found on pieces which belong to this group strongly suggests that they were made at a single factory, by one "chair," or under the direction of one person.

This collection of glass is also unusual in that all of its pieces may be considered rare, both within the group and in the general category of blown three-mold glass. The celery vase illustrated in Fig. 5a is one of four presently known to have been made in the GIII-5 mold; it is the "most common" item in this group. Several forms are apparently unique in blown three-mold glass. It is also interesting to note that in the case of objects which might be considered common in the field of blown three-mold glass, all examples which belong to the Mutzer group have rare or desirable features. To illustrate, tumblers, relatively common three-mold objects, have folded rims, are of barrel shape, or are made in unusual colors or sizes; none are "run-of-the-mill" tumblers.

The existence of a large group of glass vessels in which all of its members are exceptional is explained only if accidental breakage were selective or if all of the forms were relatively rare when they were made. The former is certainly possible since unique objects of unusual form have survived. On the other hand, when one considers that at least twenty-seven different forms, all from a single factory, are rare or unique, the theory becomes difficult to defend. The latter argument is, therefore, the more reasonable. The only reason that such a large group of glassware might be made in such limited numbers is that they were destined for the collectors' market which cherishes and pays for the unusual. They obviously were not meant for extensive retail marketing, if we may judge by the number which have survived.

If these pieces were made for the collectors' market, they must have been made at a relatively recent date, after the value of this type of ware began to rise. The most likely period of manufacture is, then, the twentieth century. Considering the history of American glass collecting it is probable that they were made between about 1920 and 1929. At least one specimen was in a collector's hands by the latter date. The most likely date of manufacture would lie toward the end of that period. Thus, it appears that this group of blown three-mold glasses was made approximately one hundred years after the initial period of popularity, generally considered to have lasted from about 1815 to 1840. If there was intent on the part of their maker to deceive, they must be considered fakes.

The conclusions advanced so far have been based entirely upon stylistic analyses. While seemingly reasonable, they are open

to criticism as selective interpretations. It was decided that a scientific investigation of the material from which these glasses were made would be undertaken in order to confirm or deny their suspected date. The tests described were conducted by both The Corning Museum of Glass and The Henry Francis du Pont Winterthur Museum.

Chemical and optical analyses of American glass, principally aimed at refining attributions, have been attempted in the past, with notable lack of success.[9] It was suspected that if the Mutzer group were of early nineteenth-century date, their chemical compositions would probably not vary markedly from those of glasses known to date from that period. If the glasses were made in the twentieth century, however, it was theorized that they would betray their age by exhibiting certain chemical or physical features which could not be correlated with older specimens. If these differences could only be explained on the basis of specific technological advances, the age of the Mutzer group would be proved.

The investigations had the following objectives: to identify and characterize the glass used in the production of the Mutzer group; to identify and characterize (as well as possible) the glass used in the production of a selected group of blown three-mold objects attributed to a number of different factories and thought to be of early nineteenth-century date; and to compare those analyses to determine if any differences could be explained by known technological innovations.

The tests may be conveniently grouped into three categories: physical, optical and chemical. The characteristics measured are obviously sometimes interrelated. The full range of tests proposed for this investigation has not been completed, but the results available have generally supported the theories advanced. Because the results of these tests offer strong evidence for dating these glasses, their publication was deemed appropriate. The few tests which remain will probably reinforce this evidence. For the sake of brevity, the data will only be summarized in this report. Complete test results will be filed in the archives of The Corning Museum of Glass and will be made available to interested students, as will the list of objects tested.

The objects were first examined for signs of use and wear. The bases of common household objects usually become scratched in daily use by microscopic abrasives such as dust. The scratches are of random width and arrangement. By contrast, "wear" induced by rubbing an object on an abrasive surface leaves scratches which are usually parallel and are often of similar width and depth.

Relatively few of the objects belonging to the Mutzer group exhibit the amount of wear one might expect to find on pieces of table glass which are supposedly over 125 years old. On the other hand, a few pieces have too much wear in areas where heavy abrasion would not normally be expected. For example, on one decanter (Fig. 19) the neck and sides, areas of little wear, are severely scratched. Also, these scratches are wide-

9. For example, see: George T. Faust, "Refractive-Index Measurements of Some Early American Glass," *Antiques, XXXII*, no. 6 (December 1937), pp. 310-311.

E. B. Haynes and W. Dan Quattlebaum, "Old Glass—Lead and Non-Lead," *Antiques, XXXVII*, no. 2 (February, 1940), p. 74.

Homer Eaton Keyes, "The Editor's Attic: Concerning Glass Composition," *Antiques, XXXVIII*, no. 4 (October, 1940), pp. 177-178.

F. H. Norton, "Identification by Tests," *Antiques, XXXI*, no. 3 (March, 1937), p. 115.

"Progress in Identifying Glass," *Antiques, XXXI*, no. 5 (May 1937), p. 235.

"The Scientific Identification of Glass," *Antiques, XXXII*, no. 2 (August 1937), pp. 76-77.

W. Dan Quattlebaum, "Testing Glass by Ultra-Violet Light," *Antiques, XXXIV*, no. 4 (October 1938), pp. 186-187.

"Tests on Cup Plates," *Antiques, XLVIII*, no. 5 (Nov. 1945), p. 286.

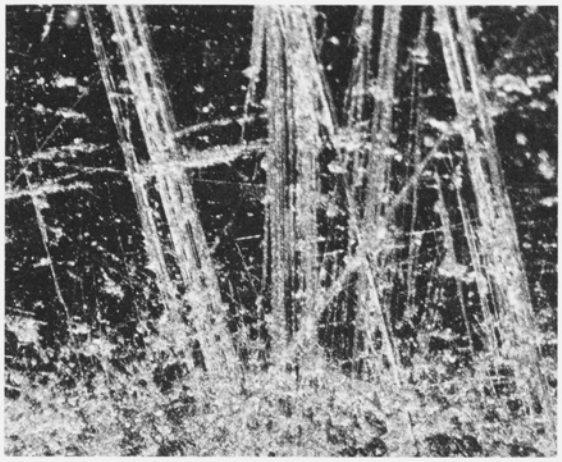

FIG. 12. *Microscopic detail of wear on a "Mutzer group" salt dish (illustrated in Fig. 39), pattern G II-18. (Photo: The Henry Francis du Pont Winterthur Museum)*

FIG. 13. *Microscopic detail of wear on a non-Mutzer group salt dish. (Photo: The Henry Francis du Pont Winterthur Museum)*

spaced and zig-zag over the surface. Wear on the extremities of objects, such as handles and spouts, although expected, is noticeably lacking on Mutzer pieces.

The microscopic appearance of "typical" wear on the bases of Mutzer pieces is illustrated in Fig. 12. Wear on the base of a piece which does not belong to the Mutzer group, and is probably of early nineteenth-century date, is shown at the same magnification in Fig. 13. Characteristic of natural wear, the scratches on this piece are of different lengths and widths and diverge at odd angles. The wear on the Mutzer piece consists of a uniformly matte area from which emerge numbers of fine parallel scratches which are of relatively uniform width and depth. In addition, several change direction in "mid-scratch." The logical source of such "wear" is mechanical.

It is possible that glasses might be seldom used and show little wear, but it is difficult to accept such a theory regarding the Mutzer group because of the large number of pieces involved. Most pieces were apparently given some cosmetic aging to make them acceptable to cautious collectors. The uniform appearance of the wear makes it likely that only one person was responsible. It is improbable that even an energetic dealer could find and abrade all the products of an early factory, let alone find that such abrasion was always necessary. A more plausible explanation is that the person who abraded these glasses had access to them as a group. This would occur only when they were new and still in the hands of the manufacturer. In that case, abrasion would be a necessity before they would find acceptance by collectors.

The character of the material itself is especially important to this study. As mentioned earlier, the glass used in the Mutzer group is remarkably free from imperfections such as seeds and stones, and is relatively free from striae. In addition, the colorless glass is free from obvious tint and the colored glasses are well-mixed. The material is obviously the product of a refined glass technology.

Ultraviolet fluorescence of the colorless glasses demonstrates that all contain lead

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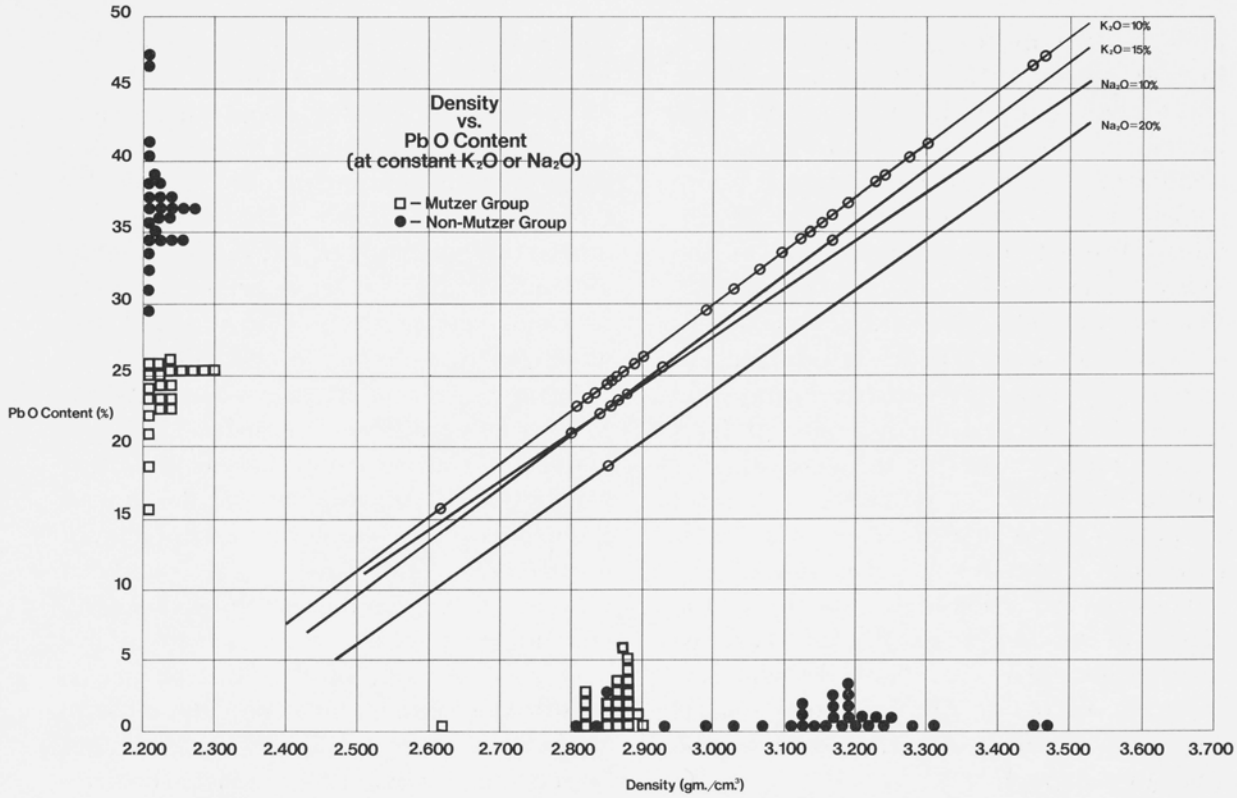

FIG. 14

oxide.[10] Other more sensitive optical and physical examination techniques demonstrate that the formulas used for the production of the Mutzer group must have been different from those used in the production of the glasses selected for comparison. The lead-oxide content of those glasses is unlike that found in the Mutzer group (which is generally lower). Several simple techniques are available for the estimation of lead-oxide content. For example, the density of glass varies with lead-oxide content. Because the density (or specific gravity) of an open glass object is easily determined, this is a safe and convenient means for estimating lead-oxide contents. The experimentally-derived variation of density with lead-oxide content, for two levels of potassium (as K_2O) and three levels of sodium (as Na_2O) concentration are plotted in Fig.14.[11] The measured densities of the Mutzer and non-Mutzer glasses are indicated on the horizontal axis. Circles represent data for non-Mutzer pieces, squares for Mutzer pieces. By projecting the data upon the appropriate experimental curves (depending upon K_2O or Na_2O concentration, as determined by chemical tests discussed later), approximate lead-oxide concentrations were estimated. Of twenty-

10. The ultraviolet fluorescence of the colorless glasses in both the Mutzer group and the "control" group is visually indistinguishable under long (3660 Å peak) and short (2537 Å peak) wave excitation, and is characteristic of glasses containing a significant amount of lead oxide.

11. Data from George W. Morey, *The Properties of Glasses* (New York: Reinhold Publishing Corporation, 1938), pp. 379, 380.

three Mutzer pieces and thirty-three non-Mutzer pieces tested, all but four of the non-Mutzer pieces have densities (and, therefore, lead-oxide concentrations) significantly greater than the Mutzer group.

Confirmation of these data may be obtained through the determination of the index of refraction, another physical test. The index of refraction of a glass is a very sensitive indicator of its lead-oxide concentration. (The index is a numerical expression which characterizes the behavior of light upon entering or leaving the glass. A glass with a high index of refraction will bend the path of a light beam, incident at an angle, more than a glass with a lower index.) The indices of refraction determined for the glasses in the two groups fall into two distinctly different ranges. With the same exceptions, all of the Mutzer group objects have lower indices of refraction than the non-Mutzer group.

The dependence of the index of refraction upon the lead-oxide concentration, for two K_2O and two Na_2O concentrations, is shown in Fig. 15.[12] We utilized these data to translate the measured indices of refraction for the glasses studied into lead-oxide concentrations. The indices for the Mutzer and non-Mutzer pieces are plotted on the horizontal axis: round dots signify non-Mutzer pieces, squares are used for Mutzer-group data.

The accuracy of these two independent tests is confirmed by the relatively close agreement of the lead-oxide concentrations estimated by the two methods. In addition, the data may be compared against other experimental data showing the variation of the index of refraction with changes in density caused by changes in lead oxide content. This relationship is plotted, for specific Na_2O and K_2O concentrations, in Fig. 16.[13] The measured data from the Mutzer and non-Mutzer glasses cluster about the experimental curves, confirming the general validity of the measurements. The observable differences may result from variations in other ingredients, such as the relative amounts of K_2O or Na_2O or the variation of CaO concentration, which would also affect the two physical properties.

From these tests it is evident that the Mutzer group differs chemically (at least in lead-oxide content) from most of the other glasses tested. This suggests that the Mutzer group was made by another manufacturer, or that these two groups were made at different dates. Neither of these divergent conclusions is easily proved, for the low lead-oxide content of the Mutzer glasses must have resulted from a conscious decision by the glassmaker. Within certain limits, the ingredients in a batch could reflect the price and availability of raw materials as well as the formula in hand. A decision to increase or decrease the lead-oxide content could be reached at any time. It is important to note, however, that the Mutzer group is quite consistent in its lead-oxide content.

Other optical properties of glasses may also be used to identify chemical differences. Transparent colored glasses may be considered as optical filters, their color depending upon the presence and chemical state of certain metallic oxides. The color of a glass can be characterized by the relative proportions of light transmitted at different wavelengths which can be measured and plotted as a transmission spectrum. The transmission curves of two amethyst pieces, a salt dish belonging to the Mutzer group (illustrated in Fig. 38) and the lid of a sugar bowl which does *not* belong to the Mutzer group, are

12. *Ibid.*

13. *Ibid.*

Lanmon, D. P.; Brill, Robert H.; and G. J. Reilly. "Some Blown 'Three-Mold' Suspicions Confirmed." The Journal of Glass Studies vol. 15 (1973): 143-173.

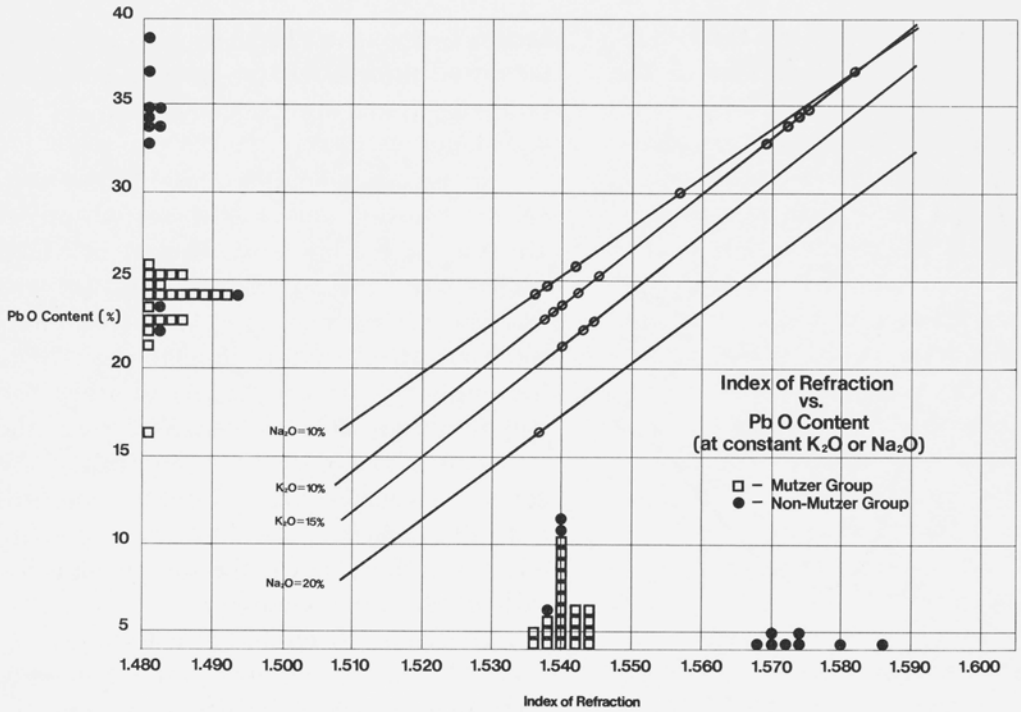

Fig. 15

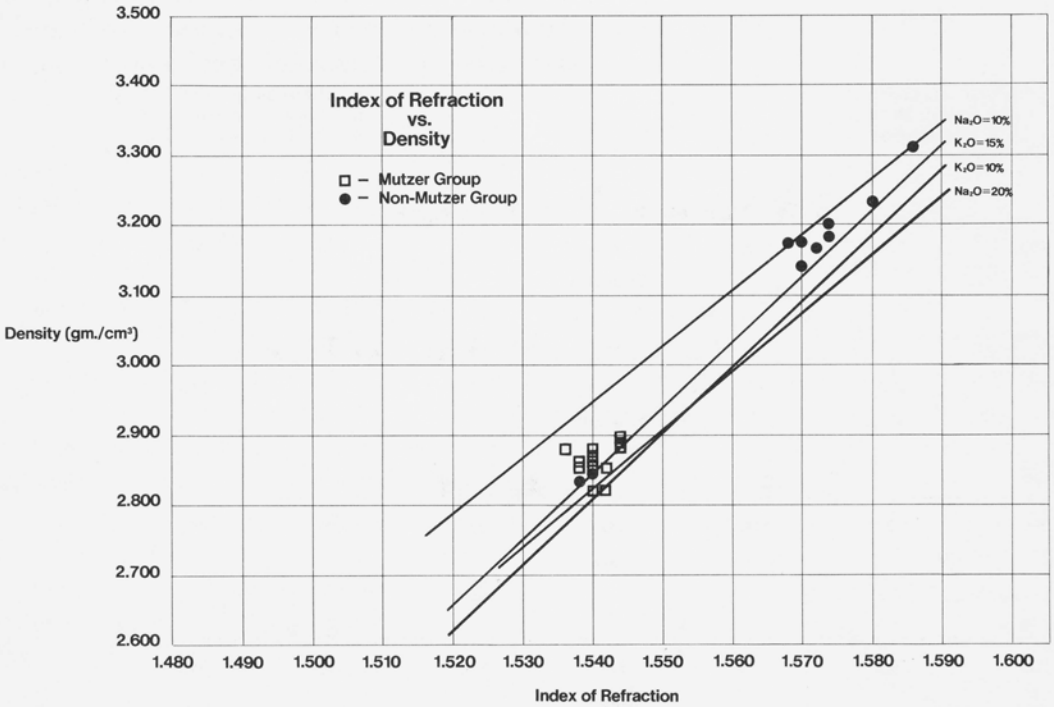

Fig. 16

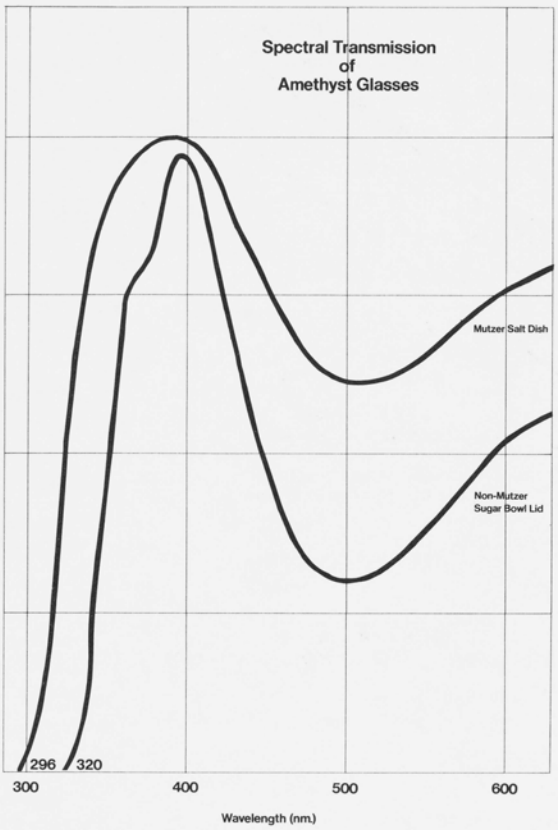

Fig. 17

shown in Fig. 17. The vertical scale at the left gives the percentage of light transmitted; the horizontal scale represents the wavelength.

Although specific differences in the optical transmission curves of these two pieces are evident, the lower wavelength at which each "filter" stops transmitting, *i.e.* the lower wavelength cut-off, is of special interest. That wavelength is affected directly by the impurities present, primarily iron. The measured cut-off also depends upon the thickness of the glass. This complicates the conclusions which may be drawn from this test, although it is possible to compensate for these differences if the samples are flat and the thicknesses measured.

Twenty-one specimens of colorless, amethyst, blue and green glass which belong to the Mutzer group, and forty-one specimens of other blown three-mold glass were examined. The lower wavelength cut-off for each piece is plotted in Fig. 18. The plots are separated according to the color of the glass; the measured lower wavelength cut-offs are arranged on horizontal axes representing

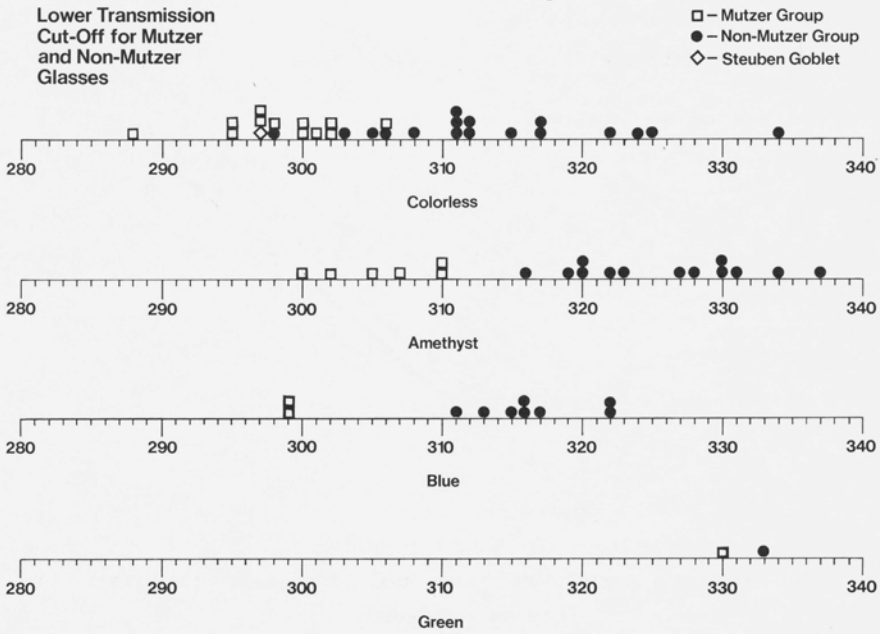

Fig. 18

wavelength. Square dots represent the data for Mutzer pieces; round ones signify the cut-offs for non-Mutzer pieces. For further comparison, in the colorless glass category, a modern Steuben goblet was tested; its lower wavelength cut-off is represented by a diamond. The results of this test are important in that they again separate the glasses according to the grouping already determined. With one exception all of the Mutzer pieces have cut-offs which are lower than those of non-Mutzer pieces. (The exceptionally low cut-off for one non-Mutzer specimen results from its extreme thinness.) These data suggest that the Mutzer pieces are relatively purer than the others, particularly in iron. Because twentieth-century glasses are expected to have lower concentrations of iron than earlier ones owing to the use of higher purity ingredients, the suggestion that these glasses are of recent date is further strengthened.

The results of the physical property tests established that compositional differences definitely exist between the two groups of glasses and suggested that these differences involved, at least, the elements lead and iron. Encouraged by the results of these tests, which were entirely non-destructive, we proceeded with actual chemical analyses to identify the compositional differences more specifically. Because large samples could not be removed from many of the objects of most interest, quantitative data were not obtained for all the objects concerned. However, minute samples were removed from the pontil marks of twenty-one pieces belonging to the Mutzer category and twenty-four pieces not associated with that group. Refractive indices were determined for all the samples, and they were then sacrificed for emission spectrographic analyses. The size of the samples was, in some cases, too small for accurate analysis, and only ranges of concentrations could be determined. Although it was realized that some differences might exist between the glass used in the body of the vessel and that used on the pontil rod, it was felt that the materials should be roughly similar. Larger pieces were removed from the bases of two Mutzer stoppers and were subjected to full quantitative wet-chemical analysis (Table). Comparative data are afforded by

TABLE QUANTITATIVE ANALYSES OF TWO MUTZER GLASSES

		CMG1489 Stopper (colorless)	*CMG1490 Stopper (blue)*
SiO_2	d	~62	~56
Na_2O	a	4.0	6.0
CaO	a	0.24	0.24
K_2O	a	10.5	10.9
MgO	a	0.14	0.23
Al_2O_3	a	0.29	1.17
Fe_2O_3		<0.01	0.01
TiO_2		0.0X	0.02
Sb_2O_5		0.0X low	<0.01
As_2O_5		<0.1	<0.1
MnO		0.02	0.02
CuO		0.0X low	2.0
CoO		<0.01	0.10
SnO_2		0.0X low	0.0X low
Ag_2O		0.00X	0.00X
PbO	g	21.7	21.7
BaO		<0.01	<0.01
SrO		<0.01	<0.01
LiO_2		0.05	0.10
Rb_2O		<0.01	<0.01
B_2O_3		0.04	0.04
V_2O_5		<0.01	<0.01
Cr_2O_3		<0.01	<0.01
NiO		<0.01	<0.01
ZnO		<0.01	<0.01
ZrO_2		<0.01	<0.01
Bi_2O_5		<0.001	<0.001
P_2O_5		~1	~1

a—Analysis by atomic absorption.
g—Analysis by gravimetry.
d—SiO_2 estimated by difference

All other analyses by emission spectrometry.

CMG1489—Winterthur no. 59.3194b; not illustrated, catalogue GII-18, no. I.A. (4).
CMG1490—Winterthur no. 70.343b; illus. Fig. 7.

quantitative analyses of fragments of three-mold wares found at the site of the Boston and Sandwich Glass Company.

In addition, the objects themselves were analyzed by the X-ray fluorescence technique. These tests were non-destructive and were conducted on the bodies of twenty-two Mutzer pieces and twenty non-Mutzer pieces. Although there is some discrepancy between the results derived from these two techniques, the differences are primarily due to inherent limitations of sensitivity and calibration. Consequently, these data are utilized only as relative indications of levels of concentration. Many important trends are detected by both techniques, adding confidence to the conclusions.

The principal ingredient of virtually all glasses of historic interest or even present day glasses is silica. Lead oxide is another major ingredient used in these glasses, as predicted by ultraviolet fluorescence, index of refraction and density measurements. Wet-chemical analyses confirm that the lead-oxide concentration in two Mutzer stoppers (21.7 per cent) is lower than that found in fragments from the site of the Boston and Sandwich Glass Company. (The range of the latter is 22.1 per cent to 34.1 per cent, with the average of nine samples at 28.3 percent.)

Secondary ingredients include both potash and soda, the latter generally the lower of the two. The colorants used are also those normally encountered: manganese for purple-tinted glasses, cobalt for blue. The only unusual colorant was detected in a green Mutzer piece. Chromium was used to produce the yellow-green color in the stopper of the decanter illustrated in Fig. 20.

Three-mold glass intentionally tinted green is rare. The green tint found in many specimens was accidental and resulted from the use of window or bottle glass which was colored by uncorrected iron impurities introduced (primarily) with silica. The presence of chromium in the one piece (the only recorded piece of green glass in the Mutzer group) is interesting and important. To date, no other example of American glass dating from the early nineteenth century has been located whose green color was produced by the addition of chromium. The importance and frequency of its use in America must await further analysis of documented glasses.

The analysis of the principal ingredients, although it supports evidence reported earlier, does not assist in the dating of these glasses. The analysis of impurities is more important in this regard, for each raw material added to the batch contributes a characteristic set of impurities. The levels of these impurities will be expected to vary, depending not only upon the source of the raw materials, but also upon their processing.

In general, it was assumed that the impurity concentrations in the Mutzer glasses would be lower than in the comparative group, if the former were, indeed, of twentieth-century date. The data reveal that this assumption is generally supported. Accurate comparisons of all the impurities detected may not always be made because they are present in concentrations below the limits of instrument sensitivity. Those impurities whose concentrations are measurable and do differ will be discussed. The more important data are summarized in the Appendix.

Iron, a material often found in sand (the probable source of the silica), was found in all of the objects analyzed. Interestingly, there is little detectible difference between the levels measured in the two groups. X-ray fluorescence measurements suggest that slightly higher iron concentrations are present in the colorless and blue non-Mutzer glasses than in the other pieces of either group. On the other hand, the iron concentration in the (Mutzer) amethyst glasses is slightly higher than that found in the ame-

thyst glasses belonging to the non-Mutzer group; that difference is, however, slight. The spectrographic data do not confirm this evidence.

The titanium concentration in the two groups of glass also differs: the level in the Mutzer pieces is generally lower than in the others. This difference is detected both by emission spectrography and X-ray fluorescence. The variation in titanium level may result from the use of two different sand sources, where the natural titanium abundance was different. It may, however, be due to the use of sand from which the titanium was commercially extracted—a twentieth-century development.

Another separating factor noted in these analyses is the difference of silver levels in these two groups. Silver, as an impurity, would be introduced into these glasses with either the lead oxide or manganese oxide, the latter used in low concentration as a decolorizer or, in higher concentrations, as a colorant. Spectrographic analysis shows that the silver content in the Mutzer pieces is lower than that found in non-Mutzer pieces in all cases. The silver content in all of the Mutzer examples tested was low, although it was slightly higher in the amethyst-colored pieces (introduced, undoubtedly, with the manganese). In the blue and amethyst non-Mutzer pieces the silver levels were higher than in the colorless pieces, as were their manganese contents. The differences between the silver levels in the two groups of glass may be due to the use of different lead sources in which the natural silver concentration was different, but this is doubtful. Naturally occurring lead contains silver, sometimes in considerable proportions, and lead has been utilized as an important silver source since ancient times. Because all of the silver cannot be commercially extracted, some must remain behind as an impurity. With the development of increasingly efficient techniques in the nineteenth century, silver was extracted to lower and lower concentrations. The levels found in the Mutzer pieces were extremely low and, in some cases, were even beyond the detection level of the analytical instruments. The levels found in non-Mutzer pieces are consistent with those expected in early nineteenth-century leads. The extremely low levels found in the Mutzer group undoubtedly reflect improvements in processing. Extraction of silver to such low levels was first accomplished about 1850 with a new technique developed by Parkes. This or a similar modern extraction process was probably used on the lead which was later introduced into the "Mutzer" glass batches as lead oxide.

The levels of other impurities are generally of little apparent technological importance. The concentration of boron in the Mutzer glasses is generally lower than in the other group but there is some overlap of data in the case of the amethyst glasses. Introduced with the alkaline flux, the variation is probably due to the source of the materials used instead of technological advance.

The alumina content of the Mutzer glasses is also generally lower than that of the other group. That difference may be due to refractory improvements, reducing the amount introduced into the melt from chemical attack on the pots, but the variation in alumina level is more likely to be attributable to differences in impurity levels in the raw materials, again suggesting the use of modern materials in making the Mutzer glasses.

The presence of antimony oxide in somewhat higher levels in the Mutzer glasses may indicate a further difference in batch formula, as it is a material often added to assist in the removal of seed, or small bubbles, from the melt. It should be noted, accordingly, that the Mutzer group does indeed have fewer seeds than the other group.

Further confirmatory tests such as the analysis of lead isotope ratios to determine the possible source of the lead ores used in the production of the Mutzer group are underway and will be reported at a future date.

In summary, we have shown that a group of selected blown three-mold glass vessels thought to be authentic are chemically, physically, and optically different from a group of highly questionable glasses which may have been made in the twentieth century. A technological date as early as the middle of the nineteenth century could be assigned with some justification to these suspect glasses, but their compositions imply a date well into the twentieth century. It is unlikely that the Mutzer group would have been made before 1900, for they would have held little mercantile appeal—they would merely have been considered out-of-date forms. It is much more likely that they were made when collecting interest in this type of glass increased—in the twentieth century. As suggested earlier, the most likely period would have been after 1920, but before 1929. On the basis of stylistic considerations and laboratory studies, it seems an inescapable conclusion that they must have been made secretly, in controlled forms, and in limited quantities, for sale to unsuspecting collectors as authentic objects of early nineteenth-century date. We can only concur with that initial murmur of disbelief regarding their authenticity. The Mutzer blown three-mold vessels are fakes.

Catalogue

This catalogue lists all of the known variations of forms of vessels which may be related by mold defects to the Mutzer group of glasses. It is arranged according to the pattern numbers assigned by the McKearins: GIII-5, GIII-6, and GII-18. All of the forms illustrated are of pieces which have been examined and identified. Other related pieces which have been published but have not been examined are neither listed nor illustrated. It is probable that this list may someday be considerably expanded. The authors would be interested to learn of other examples which may be identified with this group, especially those of different form, or pieces which are documented by histories of ownership or may be associated with a particular manufacturer.

GIII-5

The mold for this pattern was used to produce vessels of approximately one-quart volume. The form of the mold interior is not known but it was doubtless similar to the form of the decanter illustrated in figure 19. The molded decoration on that piece is the clearest and the least distorted of all the forms examined.

The specific features of this mold are:

Molding on the base: radial ribbing (46 ribs).

Molding on the sides (from the bottom to the top): band of vertical ribbing (84 ribs); horizontal ring; band of alternating fields of "diamond diapering" (seven full diamonds in a horizontal row by five full diamonds in a vertical row) and sunbursts (36 rays); horizontal ring; band of ribbing slanted to the left (78 ribs); horizontal ring; vertical ribbing (72 ribs).

Forms

I. *Decanters (three forms, five examples)*

A. Straight-sided, cylindrical form with sloping shoulders and tapered neck; flat rim; flat base with slight kick and rough pontil mark. Figure 19. (Stopper in pattern GII-18; see *GII-18*, no. I.A.)

Example:

Transparent dark blue glass: one example known (collection of The Henry Francis du Pont Winterthur Museum, purchased 1970; acc. no. 70. 343a).

Dimensions: H: 8 in.; Diam (base): 3⅜ in.

History: ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.

Mrs. Mitchell Taradash, Ardsley-on-Hudson, N.Y.

Published: George S. and Helen McKearin, *American Glass*, Plate 103, no. 8.

B. Barrel-shape, cylindrical form with sloping shoulders and tapered neck; flat rim; flat base with slight kick and rough pontil mark. Figure 20. (Stopper in pattern GII-18; see *GII-18*, no. I.A.)

Example:

Transparent light yellow-green glass: one example known (Collection of Greenfield Village and The Henry Ford Museum; acc. no. 59.28.222A).

Dimensions: H: 8 in.; Diam (base): 3⅜ in.

History: ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.

Published: George S. and Helen McKearin, *American Glass*, Plate 103, no. 7.

Fig. 19. *Blue decanter and stopper. (Photo: The Henry Francis du Pont Winterthur Museum)*

Fig. 20. *Yellow-green decanter and stopper. (Photo: the Collections of Greenfield Village and the Henry Ford Museum, Dearborn, Michigan)*

FIG. 21. *Amethyst decanter and stopper. (Photo: The Corning Museum of Glass)*

C. Globular form with sloping shoulders and tapered neck; flat rim; constricted above a drawn disk-shape foot with rough pontil mark. Figure 21. (Stopper in pattern GII-18; see *GII-18*, no. I.A.)

Examples:

Transparent amethyst glass: one example known (collection of The Corning Museum of Glass; acc. no. 55.4.206A).
Dimensions: H: 7½ in.; Diam (foot): 3 7/16 in.
History: ex coll. Mr. George Mutzer, Wildwood, N.J.
Mr. George S. McKearin, Hoosick Falls, N.Y. (purchased 1934)
Published: George S. and Helen McKearin, *American Glass*, Plate 125, no. 2; Helen and George S. McKearin, *Two Hundred Years of American Blown Glass*, Plate 87, no. 5; George S. McKearin, "From Family Glass Cupboards," *Antiques, LIX*, no. 2 (February, 1951), p. 133, fig. 5; *Antiques, LXIX*, no. 6 (June, 1956), pp. 516-517, no. 11.

Colorless glass: two examples known[14] (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3194a, 59.3195a).
Dimensions: H: 7 1/16 and 7¼ in.; Diam (foot): 3¾ in.
History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio (purchased in Philadelphia)
Mr. Henry Francis du Pont, Winterthur, Del. (purchased 1944)
Published: not published

II. *Pitchers (two forms, two examples)*

A. Barrel shape, with sloping shoulders and flared rim (possibly folded) with pouring spout; flat base with slight kick and rough pontil mark; loop handle, crimped at the lower terminal. Figure 1.

Example:

Transparent amethyst glass: one example known (collection of The Corning Museum of Glass; acc. no. 55.4.205).
Dimension: H: 6 15/16 in.; Diam (base): 3½ in.
History: ex coll. Mr. George Mutzer, Wildwood, N.J.
Mr. George S. McKearin, Hoosick Falls, N.Y. (purchased 1934)
Published: George S. and Helen McKearin, *American Glass*, Plate 125, no. 4; Helen and George S. McKearin, *Two Hundred Years of American Blown Glass*, Plate 10, no. 2; George S. McKearin, "From Family Glass Cupboards," *Antiques, LIX*, no. 2 (February, 1951), p. 133, fig. 5, Frontis.; *Antiques, LXIX*, no. 6 (June, 1956), Frontis., p. 517, no. 10.

B. Globular form with sloping shoulders and flared rim with pouring spout; constricted above a drawn disk-shape foot with rough pontil mark; loop handle, slightly crimped at the lower terminal. Figure 22.

Example:

Colorless glass: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3180).
Dimensions: H: 6½ in.; Diam (foot): 3⅝ in.

14. A colorless, footed decanter, of form similar to the Corning amethyst decanter (*GIII-5*, I. C.1.), is mentioned by George McKearin, "From Family Glass Cupboards," p. 133.

History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio
Mr. Henry Francis du Pont, Winterthur, Del. (purchased 1940)
Published: not published

III. *Tumblers (one form, three examples)*

A. Tapered cylindrical form; flat base with slight kick and rough pontil mark. Figure 23.

Examples:

Colorless glass: three examples known[15] (collections of The Corning Museum of Glass: one example, acc. no. 50.4.159; Bayou Bend Collection, Museum of Fine Arts, Houston, Texas: two examples, acc. no. 58-9-1 and 58-9-2).
Dimensions: H: 6 1/16 in. to 6¾ in.; Diam (base): 3½ in.
History:
(Corning example) ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
(Bayou Bend examples) ex coll. Miss Ima Hogg, Houston, Texas
prob. ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
Published:
(Corning example) George S. and Helen McKearin, *American Glass,* Plate 127, no. 6.
(Bayou Bend examples) not published

IV. *Celery vases (three forms, seven examples)*

A. Cylindrical form with rounded bottom and flared rim; applied disk-shape foot with rough pontil mark. Figure 5a.

Examples:

Colorless glass: four examples known (collection of Greenfield Village and the Henry Ford Museum: two examples, acc. no. 59.28.250A,B; The Henry Francis du Pont Winterthur Museum: two examples, acc. no. 59.3236 and 59.3237).
Dimensions: H; 6¼ in. to 6½ in.; Diam (foot): 2⅞ in. to 3⅛ in.
History:
(Ford examples) ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.

15. An apparently identical tumbler is illustrated in the sales catalogue of the collection of Mr. William Mitchell van Winkle, Parke-Bernet Galleries, Inc., April 28-29, 1938, lot no. 425, p. 75.

Fig. 22. *Colorless pitcher. (Photo: The Henry Francis du Pont Winterthur Museum)*

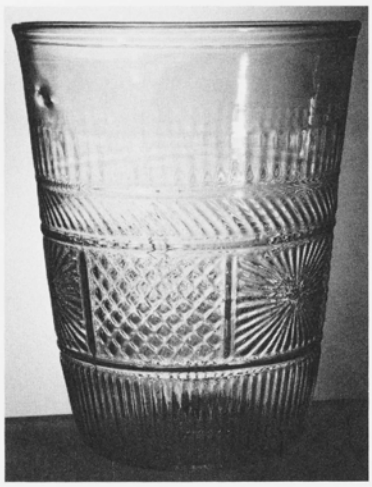

Fig. 23. *Colorless tumbler. (Photo: The Corning Museum of Glass)*

(Winterthur examples) ex coll. Mr. Arthur Sussel, Philadelphia, Pa.
Mr. Henry Francis du Pont, Winterthur, Del. (purchased 1934)
Published:
(Ford examples) Helen McKearin, "American Glass from the McKearin Collection at the Henry Ford Museum," *Antiques, LXXVII,* no. 6 (June, 1960), p. 585, fig. 15.
(Winterthur examples) not published

FIG. 24

FIG. 25

FIG. 26

FIG. 24. *Colorless celery vase. (Photo: The Corning Museum of Glass)*

FIG. 25. *Colorless celery vase. (Photo: The Henry Francis du Pont Winterthur Museum)*

FIG. 26. *Colorless vase. (Photo: The Henry Francis du Pont Winterthur Museum)*

B. Cylindrical form with rounded bottom and downturned rim; disk-shape foot with rough pontil mark. Figure 24.

Examples:

Colorless glass: two examples known (collection of The Corning Museum of Glass; acc. no. 50.4.121A,B).
Dimensions: H: 6¼ to 6⅜ in.; Diam (foot); 2⅞ to 3 in.
History: ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
Published: not published

C. Cylindrical form with rounded bottom and downturned rim; short stem with flattened ball knop; conical foot with rough pontil mark. Figure 25.

Example:

Colorless glass: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3192).
Dimensions: H: 6⅞ in.; Diam (foot): 3¾ in.
History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio.
Mr. Henry Francis du Pont, Winterthur, Delaware (purchased 1940)
Published: not published

V. *Vase (one form, one example*[16]*)*

A. Tapered cylindrical form with flat rim; flat base with slight kick and rough pontil mark. Figure 26.

Example:

Colorless glass: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3187).
Dimensions: H: 5¼ in.; Diam (base): 3⅜ in.
History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio
Mr. Henry Francis du Pont, Winterthur, Del. (purchased 1941).
Published: not published

VI. *Compote (one form, one example)*

A. Cylindrical bowl with rounded bottom, vertical rim with trailed transparent blue ring at edge; applied short stem with central flattened ball knop; conical foot with rough pontil mark. Figure 27.

Example:

Colorless glass with transparent blue rim: one example known (collection of The Corning

16. An apparently identical "vase" is illustrated in the sales catalogue of Mrs. Frederick S. Fish, Parke-Bernet Galleries, Inc., January 5-6, 1940, lot no. 332, p. 71, where it is listed as "unique." The acquisition of this vase in June, 1941, would suggest that the piece in the Fish collection and this are the same. Comments in mss. correspondence between Neil C. Gest and Henry Francis du Pont would indicate that this vase is not the one in the Fish sale. A second example has not, however, been located.

Museum of Glass, acc. no. 55.4.209).
Dimensions: H: 6½ in.; Diam (foot): 4 5/16 in.; Diam (bowl rim): 6⅝ in.
History: ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
Published: Helen and George S. McKearin, *Two Hundred Years of American Blown Glass*, Plate 19, no. 2; *Antiques, LXIX*, no. 6 (June, 1956), p. 520, no. 16.

VII. *Sugar bowl (one form, three examples)*

A. Globular form with galleried rim; constricted above a drawn disk-shape foot with rough pontil mark. Figure 28. (Cover in pattern GIII-6: see *GIII-6*, no. VII.A)

Examples:

Transparent dark blue glass: one example known (collection of The Corning Museum of Glass; acc. no. 55.4.208A).
Dimensions: H: 4 9/16 in.; Diam (foot): 3 11/16 in.; H (with cover): 6¼ in.
History: ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
Published: George S. and Helen McKearin, *American Glass*, Plate 125, no. 3.

Transparent amethyst glass: two examples known (collections of Greenfield Village and the Henry Ford Museum, acc. no. 55.21.11A; and the New Orleans Museum of Art, acc. no. 630).
Dimensions:
(Ford example) H (with cover): 6¾ in.
(New Orleans example) H (with cover): 7 in.
History:
(Ford example) ex coll. Mr. George Mutzer, Wildwood, N.J.
Mr. George S. McKearin, Hoosick Falls, N.Y. (purchased 1934)
Mr. William T. H. Howe, Cincinnati, Ohio
Mr. Laing, Mich. (location unknown)
(New Orleans example) ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y. (purchased 1934, prob. from Mr. George Mutzer, Wildwood, N.J.)
Mr. Melvin P. Billups, N.Y., N.Y.
Published:
(Ford example) Anon., "The Glass [at the Henry Ford Museum]," *Antiques, LXXIII*, no. 2 (February, 1958), p. 170, Fig. 7; *Selected Treasures of Greenfield Village and Henry Ford Museum*, p. 54; George S. McKearin, "From Family Glass Cupboards," *Antiques, LIX*, no. 2 (February, 1951), p. 133, fig. 5; George S. and Helen McKearin, *American Glass*, Plate 125, no. 5.
(New Orleans example) Paul N. Perrot, *A Decade of Glass Collecting*, p. 57, fig. 93.

FIG. 27. *Colorless compote with dark blue rim. (Photo: The Corning Museum of Glass)*

FIG. 28. *Blue sugar bowl and cover. (Photo: The Corning Museum of Glass)*

GIII-6

The mold for this pattern was used to produce vessels of approximately one-pint size. As in the case of the GIII-5 mold, the shape of the mold cavity is not known. It was doubtless of simple form, perhaps that of a tapered tumbler, from which all of the other forms were produced.

The objects patterned in this mold are of great variety. Anticipated forms include cream jugs, tumblers and salt dishes; unparalleled forms include unusual small vases and bowls.

The specific features of this pattern are:

Molding on the base: radial ribbing (50 ribs).

Molding on the sides (from bottom to top): band of vertical ribbing (90 ribs); horizontal ring; band of alternating fields of "diamond diapering" (five full diamonds in a horizontal row by four full diamonds in a vertical row) and sunbursts (26 rays); horizontal ring; band of ribbing slanted to the right (83 ribs); horizontal ring; band of vertical ribbing (76 ribs).

Fig. 29. *Amethyst tumbler. (Photo: The Corning Museum of Glass)*

Fig. 30. *Colorless tumbler with folded rim. (Photo: The Henry Francis du Pont Winterthur Museum)*

Fig. 31. *Colorless tumbler. (Photo: The Henry Francis du Pont Winterthur Museum)*

Forms

I. *Tumblers (three forms, four examples)*

A. Tapered form, flat base with slight kick, rough pontil mark. Figure 29.

Examples:

Transparent amethyst glass: two examples known (collections of The Corning Museum of Glass, acc. no. 55.4.207; and Greenfield Village and the Henry Ford Museum, acc. no. 59.28.224).

Dimensions:

(Corning example) H: 4¼ in.; Diam (base): 2 7/16 in.

(Ford example) H: 3 7/16 in.; Diam (base): 2½ in.

History:

(Corning example) ex coll. Mr. George Mutzer, Wildwood, N.J.

Mr. George McKearin, Hoosick Falls, N.Y. (purchased 1934)

(Ford example) ex coll. Mr. George Mutzer, Wildwood, N.J.

Mr. George S. McKearin, Hoosick Falls, N.Y. (purchased 1934)

Published:

(Corning example) Helen and George S. McKearin, *Two Hundred Years of American Blown Glass*, Plate 10, no. 3; George S. McKearin, "From Family Glass Cupboards," *Antiques, LIX*, no. 2 (February, 1951), p. 133, fig. 5.

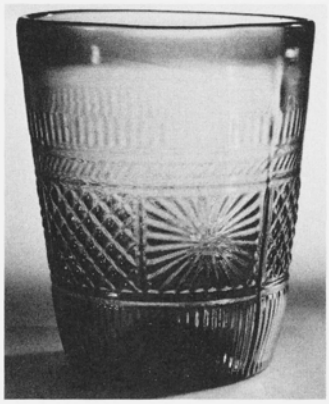

Fig. 29

Fig. 30

Fig. 31

(Ford example) George S. and Helen McKearin, *American Glass*, Plate 125, no. 1; George S. McKearin, "From Family Glass Cupboards," *Antiques, LIX*, no. 2 (February, 1951), p. 133, fig. 5.

B. Tapered form; folded rim; flat base with slight kick and rough pontil mark. Figure 30.

Example:

Colorless glass: one example known[17] (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3193).
Dimensions: H: 3⅞ in.; Diam (base): 2⅜ in.
History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio
Mr. Henry Francis du Pont, Winterthur, Delaware (purchased 1941)
Published: not published

C. Barrel form; flat base with slight kick and rough pontil mark. Figure 31.

Example:

Colorless glass: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3169).
Dimensions: H: 3⅝ in.; Diam (base): 2½ in.
History: ex coll. Mr. Henry Francis du Pont, Winterthur, Delaware (purchased prior to August, 1939).
Published: not published

II. *Cream jug (one form,*[18] *three examples)*

A. Barrel form with flared rim and pouring spout; loop handle, crimped at the lower terminal; flat base with slight kick and rough pontil mark. Figure 6a.

Examples:

Transparent dark blue glass: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 70.344).
Dimensions: H: 4 9/16 in.; Diam (base): 2¼ in.
History: ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
Mrs. Mitchell Taradash, Ardsley-on-Hudson, N.Y.
Published: not published.

Transparent amethyst glass: one example known (collection of The Henry Francis du Pont Winterthur Museum, acc. no. 59.3105).
Dimensions: H: 4⅜ in.; Diam (base): 2⅜ in.
History: prob. ex coll. Mr. George Mutzer, Wildwood, N.J.[19]
ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio
Mr. Henry Francis du Pont, Winterthur, Delaware (purchased 1929).
Published: not published

Colorless glass with transparent dark blue handle: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3277).
Dimensions: H: 4 in.; Diam (base): 2¼ in.
History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio
Mr. Henry Francis du Pont, Winterthur, Delaware (purchased 1940)
Published: not published

III. *Salt dishes (one form, two examples*[20]*)*

A. Rounded form with galleried rim; constricted stem and drawn disk-shape foot with rough pontil mark. Figure 32.

Examples:

Transparent amethyst glass: two examples known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3101 and 59.3104).

17. An apparently identical tumbler (but probably this one) is illustrated in the sales catalogue of the collection of Mr. William T. H. Howe (Parke-Bernet Galleries, April 3-4, 1941, lot no. 441, illus. p. 67).

18. A footed, blue cream jug in pattern GIII-6, of form similar to that illustrated in figure 21, and sharing many characteristics with the cream jugs listed, was illustrated in the sales catalogue of the collection of Mr. William Mitchell van Winkle, Parke-Bernet Galleries, Inc., April 28-29, 1938, lot no. 506, p. 89. The present location of this cream jug is unknown, so final identification is not possible at this time.

19. Letter from Mrs. George Mutzer to Mr. Roland Whilden (n.d.), refers to "2 small Pitchers or creamers one for each end of table," probably in reference to this cream jug, and another not yet located. In two different copies of a checklist of the collection of Mr. Henry Francis du Pont, prepared by Neil C. Gest in August, 1939, it is variously stated that this cream jug was found in New Jersey, and also that it was "Found in New England, brought to New Jersey and purchased from dealer there." It seems most likely that this cream jug was originally from the Mutzer set, and that the story of a New England source was a fabrication.

20. Numerous salt dishes of related form are illustrated in auction sales catalogues; no others have been located for identification.

FIG. 32. *Amethyst salt dish. (Photo: The Henry Francis du Pont Winterthur Museum)*

FIG. 33. *Colorless vase on stem and foot. (Photo: The Corning Museum of Glass)*

Dimensions: H: 3 in. and 3 1/16 in.; Diam (foot): 2 3/8 in. (both)
History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio
Mr. Henry Francis du Pont, Winterthur, Delaware (purchased 1931 and 1947)
Published: not published

IV. *Vase (two forms, two examples)*

A. Barrel-shape bowl with flared rim, flat bottom; applied short stem with central flattened ball knop; conical foot with rough pontil mark. Figure 33.

Example:

Colorless glass: one example known (collection of The Corning Museum of Glass; acc. no. 55.4.202).
Dimensions: H: 5 3/16 in.; Diam (foot): 2 7/8 in.
History: ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
Published: Helen and George S. McKearin, *Two Hundred Years of American Blown Glass*, Plate 68, no. 5.

B. Tapered form with rounded shoulders and flared rim; flat base with slight kick and rough pontil mark. Figure 34.

Example:

Transparent dark blue glass: one example known (collection of The Corning Museum of Glass; acc. no. 50.4.183).
Dimensions: H: 3 1/4 in.; Diam (base); 2 5/16 in.
History: ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
Published: not published

V. *Bowls (three forms, three examples)*

A. Globular form with flared rim; constricted stem with drawn disk-shape foot and rough pontil mark. Figure 35.

Example:

Transparent dark blue glass: one example known (collection of the Bennington Museum; acc. no. CH98).
Dimensions: H: 3 in.; Diam (foot): 2 1/4 in.
History: ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
Mr. Channing Hare—Mr. Mountfort Coolidge, Palm Beach, Florida.
Published: not published

B. Tapered form with angular shoulder and flared rim; flat base with slight kick and rough pontil mark. Figure 36.

Example:

Transparent amethyst glass: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3111).
Dimensions: H: 2 5/8 in.; Diam (base): 2 3/8 in.
History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio[21]
Mr. Henry Francis du Pont, Winterthur, Delaware (purchased 1931)
Published: not published

21. Neil C. Gest states, in a checklist of Mr. du Pont's collection, prepared in 1939, that this bowl was "Found in Pennsylvania by dealer who sold it directly to me."

FIG. 34

FIG. 35

FIG. 36

FIG. 34. *Blue vase. (Photo: The Corning Museum of Glass)*

FIG. 35. *Blue bowl. (Photo: Bennington Museum, Bennington, Vermont)*

FIG. 36. *Amethyst bowl. (Photo: The Henry Francis du Pont Winterthur Museum)*

C. Rounded form with vertical rim; drawn disk-shape foot and rough pontil mark. Figure 37.

Example:

Transparent dark blue glass: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3284).

Dimensions: H: 2⅝ in.; Diam (foot): 2⅜ in.

History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio[22]

Mr. Henry Francis du Pont, Winterthur, Delaware (purchased 1930)

Published: not published

VI. *Flask (one form, one example[23])*

A. Flattened-ovoid form with cylindrical neck; flat base with slight kick and rough pontil mark. Figure 38.

FIG. 37. *Blue bowl. (Photo: The Henry Francis du Pont Winterthur Museum)*

FIG. 38. *Colorless flask. (Photo: The Henry Francis du Pont Winterthur Museum)*

22. In two copies of the same checklist of the collection of Henry Francis du Pont, prepared by Neil C. Gest in August, 1939, it is variously stated that this bowl was found in Virginia in 1929, and also that it was "Found in small dealer's shop in Pennsylvania near Philadelphia. Party told me they bought it directly from private home in Germantown, Pa." It is probable that the former refers, instead, to a blue "diamond-daisy" Stiegel-type flask, also in the collection, which has the same reported history.

23. Another flask of similar form was illustrated in the sales catalogue of the collection of Mr. William W. Wood, 3d, Parke-Bernet Galleries, Inc., January 22-23, 1942, lot no. 144, illus. p. 29; ex coll. Mr. Richard Loeb, Mr. Neil C. Gest, Mrs. Hiram Norcross. The present location of this flask is not known and its identification with this group is not proved.

An additional specimen which bears a close relationship to both of these flasks is illustrated in the Parke-Bernet sales catalogue of Prince Cantacuzene, Sarasota, Florida (November 5, 1948; lot no. 159, illus. p. 27). This example also has not been located for identification.

Example:

Colorless glass: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3198).
Dimensions: H: 5 in.; W: 3½ in.; D: 2¼ in.
History: ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio
Mr. Alfred B. Maclay (purchased 1931; sold at Parke-Bernet Galleries, Mar. 7-8, 1945, lot no. 481, illus. p. 95)
Mr. Henry Francis du Pont, Winterthur, Delaware (purchased 1945)

VII. *Sugar bowl covers (one form, three examples)*

A. Domed form with drawn, bulbous knob with disk-shape finial; rough pontil mark on finial. (See, also, sugar bowls: *GIII-5,* no. VII.A.) Figure 28.

Examples:

Transparent dark blue glass: one example known (collection of The Corning Museum of Glass; acc. no. 55.4.208A).
Dimensions: H: 3¼ in. Diam (rim): 3 11/16 in.
History: see sugar bowls.
Published: see sugar bowls.

Transparent amethyst glass: two examples known (collections of Greenfield Village and the Henry Ford Museum, acc. no. 55.21.11B; and the New Orleans Museum of Art, acc. no. 630).
Dimensions:
(Ford example) H: 3¼ in.; Diam (rim): 4½ in.
(New Orleans example) Not available.
History: see sugar bowls.
Published: see sugar bowls.

GII-18

The mold for this pattern was used for the production of decanter stoppers and salt dishes. The mold cavity was doubtless of stopper form; other objects were produced by manipulation of that basic form.

The specific features of this mold are (from the rounded top of the stopper, to the shank):

Radial ribbing (36 ribs); horizontal ring; band of "diamond diapering" (27 diamonds in a horizontal row, three diamonds in a vertical row); horizontal ring; band of vertical ribbing (39 ribs).

FORMS:

I. *Decanter stoppers (one form, five examples)*

A. Hollow, spherical form, constricted above a hollow, tapered shank. Figures 7, 19, 20, 21. (See, also, decanters, *GIII-5,* no's. I.A.-C.)

Examples:

Transparent dark blue glass: one example known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 70.343b).
Dimensions: H: 3⅜ in.; Diam (max): 1⅞ in.
History: see decanters.
Published: see decanters.

Transparent light yellow-green glass: one example known (collection of Greenfield Village and the Henry Ford Museum; acc. no. 59.28.222B).
Dimensions: H: 3⅜ in.; Diam (max): 1⅞ in.
History: see decanters.
Published: see decanters.

Transparent amethyst glass: one example known (collection of The Corning Museum of Glass; acc. no. 55.4.206A).
Dimensions: H: 3 7/16 in.; Diam (max): 1⅞ in.
History: see decanters.
Published: see decanters.

Colorless glass: two examples known (collection of The Henry Francis du Pont Winterthur Museum; acc. no. 59.3194b and 59.3195b).
Dimensions: H: 3⅜ in.; Diam (max): 1⅞ in.
History: see decanters.
Published: not published

II. *Salt dishes (two forms, five examples)*

A. Rounded form with galleried rim; applied disk-shape foot with rough pontil mark. Figure 39.

Examples:

Transparent amethyst glass: three examples known (collections of The Henry Francis du Pont Winterthur Museum: two examples, acc. no. 59.3094, 59.3097; New Orleans Museum of Art: one example, acc. no. 284).

FIG. 39. *Amethyst salt dish. (Photo: The Henry Francis du Pont Winterthur Museum)*

FIG. 40. *Amethyst salt dish. (Photo: The Corning Museum of Glass)*

Dimensions:
(Winterthur examples) H: 2¾ in. and 2 5/16 in.; Diam (foot): 2⅛ in. (both)
(New Orleans example) H: 2½ in.; Diam (foot): 2 in.

History:
(Winterthur examples)
(one) ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio.
Mr. Henry Francis du Pont, Winterthur, Delaware (purchased May, 1941).
(one) ex coll. Mr. Neil C. Gest, Mechanicsburg, Ohio (purchased about 1928).
Mr. William W. Wood, 3d, Piqua, Ohio.
Mr. Alfred B. Maclay (location unknown), (sold at Parke-Bernet, March 23-25, 1939, lot no. 486, illus. p. 123).
Mr. Richard Loeb, Hampton, N.J.
Mr. Henry Francis du Pont, Winterthur, Delaware (purchased January, 1946).
(New Orleans example) ex coll. Mr. Melvin P. Billups, New York City.
Published: not published

B. Globular form; applied disk-shape foot with rough pontil mark. Figure 40.

Examples:
Transparent amethyst glass: two examples known (collections of The Corning Museum of Glass, acc. no. 55.4.237; and the Bennington Museum, acc. no. CH77).
Dimensions:
(Corning example) H: 2½ in.; Diam (rim): 2 7/16 in.
(Bennington example) H: 2⅛ in.; Diam (rim): 2 7/16 in.
History:
(Corning example) ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
(Bennington example) ex coll. Mr. George S. McKearin, Hoosick Falls, N.Y.
Mr. Channing Hare and Mr. Mountfort Coolidge, Palm Beach, Florida.
Published:
(Corning example) George S. and Helen McKearin, *American Glass,* Plate 110, no. 8; Helen and George S. McKearin, *Two Hundred Years of American Blown Glass,* Plate 9, no. 3.
(Bennington example) Not published.

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Lanmon, D. P.; Brill, Robert H.; and G. J. Reilly. "Some Blown 'Three-Mold' Suspicions Confirmed." The Journal of Glass Studies vol. 15 (1973): 143-173.

APPENDIX: SUMMARY OF ANALYTICAL DATA

Colorless Glasses

	Analytical source	Fe_2O_3	TiO_2	Ag_2O	MnO	B_2O_3	Al_2O_3	Sb_2O_5
Mutzer group	CMG (C) (10 samples)	min. 0.005-0.05 max. 0.01-0.1 ave. 0.007-0.07	min. 0.0005-0.005 max. 0.005-0.05 ave. 0.001-.01	not detected	min. 0.005-0.05 max. "minor" ave. 0.005-0.05	min. 0.001-0.01 max. 0.005-0.05 ave. 0.002-.02	min. 0.005-0.05 max. 0.05-0.5 ave. 0.015-0.15	min. 0.005-0.05 max. "minor"
	CMG (LP) (8 samples)	min. <0.01 max. <0.1	min. 0.00X-<0.01 max. 0.02 ave. 0.007	<0.001	min. 0.00X-<0.01 max. 0.1 (one sample) ave. 0.00X-<.01	min. <0.01 max. 0.03 (one sample) ave. <0.01	min. <0.1 max. 0.2 ave. <0.1	min. 0.0X low max. <0.1 ave. 0.0X
	Winterthur (12 samples)	min. 0 max. 0.03 ave. 0.01	min. 0 max. trace	not detected	min. 0 max. 0.5 (one sample) ave. 0	not detected	not detected	min. 0.004 max. 0.007 ave. 0.005
	Quantitative (1 sample)	min. <0.01	min. 0.0X	<0.00X	min. 0.02	min. 0.04	min. 0.29	min. 0.0X low
non-Mutzer group	CMG (C) (1 sample)	min. 0.01-0.1	min. 0.01-0.1	min. 0.0001-0.001	min. 0.005-0.05	min. 0.005-0.05	min. 0.01-0.1	not detected
	CMG (LP) (6 samples)	min. <0.01 max. <0.1	min. 0.03 max. 0.10 ave. 0.05+	min. 0.001 max. 0.002 ave. 0.001+	min. 0.01 max. 0.05 ave. 0.04	min. 0.01 max. 0.05 ave. 0.03	min. <0.1 max. 0.1-0.2 ave. 0.1-0.2	min. not detected max. <0.1
	Winterthur (11 samples)	min. 0 max. 0.03 ave. 0.01	min. trace max. 0.030 ave. 0.011	min. 0 max. 0.003 ave. 0.001	min. 0 max. 0.02 ave. 0.002	not detected	not detected	min. 0.002 max. 0.010 ave. 0.003
	Quantitative (10 samples)	min. <0.01 max. 0.05 ave. 0.02	min. 0.01 max. 0.13 ave. 0.08	min. <0.001 max. 0.100 ave. 0.012	min. 0.01 max. 0.10 ave. 0.03	min. 0.02 max. 0.10 ave. 0.05	min. 0.23 max. 0.62 ave. 0.45	min. <0.01 max. 0.01 ave. <0.01

Amethyst Glasses

Mutzer group	CMG (C) (4 samples)	min. 0.01-0.1 ave. 0.01-0.1	min. 0.001-.01 max. 0.005-.05 ave. 0.003-.03	min. 0.0001-0.001 ave. 0.0001-0.001	min. 0.05-0.5 ave. 0.05-0.5	min. 0.001-.01 max. 0.005-.05 ave. 0.004-.04	min. 0.05-0.5 max. 0.1-1.0 ave. 0.08-0.8	min. not detected max. 0.005-0.05 (one sample) ave. 0
	CMG (LP) (4 samples)	min. <0.01 max. <0.1	min. 0.00X-<0.01 max. <0.01 ave. <0.01	min. 0.001 ave. 0.001	min. 0.18 max. 0.60 ave. 0.44	min. <0.01 max. 0.02 (one sample) ave. <0.01	min. <0.1 max. 0.1 (one sample) ave. <0.1	min. <0.01 max. <0.1 ave. <0.1
	Winterthur (6 samples)	min. 0.05 max. 0.16 ave. 0.08	min. 0 max. 0.009 (one sample) ave. 0	not detected	min. 0.06 max. 0.25 ave. 0.15	not detected	not detected	min. 0.002 max. 0.0075 ave. 0.004
non-Mutzer group	CMG (LP) (2 samples)	min. <0.01 ave. <0.01	min. 0.02 max. 0.03 ave. 0.02+	min. 0.002 ave. 0.002	min. 0.10 max. 0.25 ave. 0.18	min. <0.01 max. 0.01 ave. <0.01	min. 0.1-0.2 ave. 0.1-0.2	not detected
	Winterthur (5 samples)	min. 0.05 max. 0.10 ave. 0.06	min. 0.008 max. 0.018 ave. 0.013	min. not detected max. "trace"	min. 0.07 max. 0.15 ave. 0.09	not detected	not detected	min. 0.002 max. 0.003 ave. 0.002+
	Quantitative (1 sample)	min. 0.07	min. 0.07	min. 0.001	min. 1.2	min. 0.05	min. 0.53	min. 0.01

Lanmon, D. P.; Brill, Robert H.; and G. J. Reilly. "Some Blown 'Three-Mold' Suspicions Confirmed." The Journal of Glass Studies vol. 15 (1973): 143-173.

Blue Glasses

	Analytical source	Fe_2O_3	TiO_2	Ag_2O	MnO	B_2O_3	Al_2O_3	Sb_2O_5	CoO
Mutzer group	CMG (C) (2 samples)	min. 0.01-0.1	min. 0.001-.01	not detected	min. 0.005-0.05	min. 0.001-0.01 max. 0.005-0.05	min. 0.05-0.5 max. 0.1-1.0	min. 0.01-0.1	min. 0.05-0.5
	CMG (LP) (2 samples)	min. <0.01	min. 0.00X-<0.01	min. <0.001	min. 0.00X-<0.01	min. <0.01	min. 0.1	min. <0.01	min. 0.15 max. 0.20
	Winterthur (3 samples)	min. 0 max. 0.05 ave. 0.03+	min. 0 max. trace	not detected	min. 0 max.0.02 (one sample)	not detected	not detected	min. 0.003 max. 0.005 ave. 0.004	min. 0.05 max. 0.08 ave. 0.06
	Quantitative (1 sample)	min. 0.01	min. 0.02	min. 0.0X	min. 0.02	min. 0.04	min. 1.17	min. <0.01	min. 0.10
non-Mutzer group	CMG (LP) (1 sample)	min. 0.01	min. 0.08	min. 0.002	min. 0.10	min. 0.05	min. 0.1-0.2	min. 0.0X low	min. 0.18
	Winterthur (4 samples)	min. 0.05 max. 0.06 ave. 0.05+	min. 0.012 max. 0.015 ave. 0.014	not detected	min. 0.02 max. 0.08 ave. 0.05	not detected	not detected	min. 0.002 max. 0.0075 ave. 0.005	min. 0 max. 0.075 ave. 0.04+