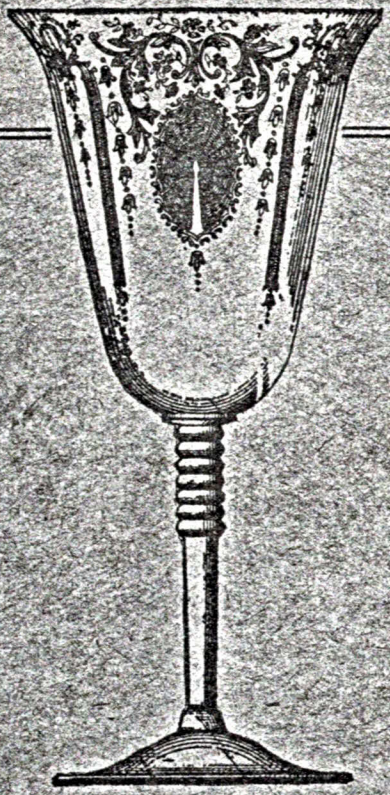

STORY OF GLASSWARE

STORY
OF
GLASSWARE

by
A. W. Baumgardner

GRATEFULLY I wish to acknowledge the encouragement and assistance in preparing the technical data for this booklet given by my friends and co-workers at the Cambridge Glass Company:—

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—A. W. BAUMGARDNER.

STORY
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GLASSWARE

ORIGIN

What is Glass?

A large European glassware manufacturer in a recent pamphlet concludes that if light and radium can change the color of glass and the original color can be brought back by reheating, then glass is not a perfectly organized and unchangeable body but an amorphous substance constantly in process of organization. It is therefore not too much to suppose that Glass has Life. Rather a poetic description to be sure. This definition may be born of the natural pride of a man engaged in this ancient industry. In all probability the description contains more truth than poetry after all.

Glass is a Fused Mixture of Acid and Alkali Earths

The basic ingredient is silicic acid in the form of silica sand fused with some kind of alkali such as lime, potash, soda ash or lead oxide.

Silica is a form of silicon combined with oxygen, the chemical formula being SIO_2, meaning one part of silicon to two parts of oxygen. Therefore, we see that the basic ingredient of glass is a combination of the two most abundant elements on the surface of the earth, oxygen being the most abundant element and silicon the second most abundant.

Glassmaking goes back so far into antiquity that no one knows when the first glass was made. PLINY, who died in Pompei during the great eruption of Mount Vesuvius, writes that glass was first discovered in Phoenicia. He relates that a boatload of traders with a cargo of nitrates being forced to land on a white sandy beach, in order to cook their food, built up a furnace of nitre blocks from their cargo which melted with the heat of the fire and combined with the white sand of the beach to form a curious transparent material, later to become known as glass.

Another narrator says that once upon a time there was a great forest fire which burnt down to the beach and large trees fell over into the sand so that the ashes mixed with the sand and the heat from these burning trees caused part of the beach to turn into a mass of crystal. All that can be said of this is, that it certainly must have been a very great forest fire, indeed.

These legends may or may not be founded on some fact but even if they did happen as related, very probably this was not the first time that glass had been made accidentally by man. More probably the first glass was produced by some cave dweller who built a hot fire against a cliff or the wall of his cave. The Medians, the Persians, the Assyrians, and the Egyptians all manufactured glass at a very early period.

According to some historians, glass was first manufactured in Egypt, the year being indefinite, probably about four thousand years B. C. Glass was also made by the Phoenicians at about the same time and whether the art was introduced from Egypt or vice versa cannot be said now. It was a custom in both of these countries to make burnt offerings of grain, fruit and animals to the Deity. Altars were built of stone and intense fires were required to consume these sacrifices. Fires so extremely hot may have produced glass, by fusing sandstone with marble or limestone and may have been the reason for these sections being the first manufacturers of glass.

The hot part of a fire is upward and a strong current of air is necessary to make a wood fire hot enough to melt glass.

It is a matter of history that the manufacture of glassware was brought to Venice by Roman soldiers who invaded Egypt many times. The early part of the Fifth Century marked the beginning of glassware manufacture in Venice, which became the center of glassware-making in Europe. This industry proved very profitable to Venice, so much so, that the Venetians took steps to monopolize and control the business. Under pretext of the numerous glass furnace fires being a hazard to the city itself, the industry was moved to the Island of Murano, which is separated from the city by a narrow strip of water. The real reason for this move however, was so that spies from other cities and countries could be more easily kept away from these factories and also the workers could be more closely watched and kept in Venice. These workers were held practically as prisoners, so great was the desire to keep the secrets of glassmaking in Venice.

Of the early figures in Venetian glass manufacture were Carlo Marine and Count Filiasi; also Angelo Beroviero who made important improvements and Paolo Godi da Pergola, a chemist who discovered many formulae for coloring glass.

Later the manufacture of glass began in Germany and Bohemia. This glassware was of a different nature and the shapes were nothing like the Venetian glass, but even so this glass was, no doubt, the output of renegade workmen or spies who obtained their knowledge at Venice. The center of this industry was moved from Venice to Constantinople when the Goths first invaded Italy, but years later Venice began again to assume her old prominence in this art. France, Belgium, and later England, became interested in the manufacture of glass, but not much glass was made in England until the reign of Queen Elizabeth. Later this country became the center for fine lead glassware.

AMERICAN DEVELOPMENT

It is remarkable that one of the first European industries ever established in America was glass manufacturing. The first settlers at Jamestown in 1608 established a small furnace about a mile outside of the stockade. The main object in the establishment of this early glass factory was to make beads for trading with the Indians. On account of poor material, lack of skill, and fireproof melting pots this first factory proved a failure. Later on Italian workmen were imported and the manufacturing of glass was continued at Jamestown until the Massacre of 1622.

Successful glassworks appeared in Massachusetts about 1639 to 1644. A little more than a hundred years later, glassware was made in Pennsylvania by Baron Steigel. He imported workmen from Germany. His dark blues and greens are still much sought by collectors.

In 1827 a carpenter by the name of Deming Jarves at Sandwich discovered a new method for pressing glass in a mold. This discovery served to put Sandwich far ahead in the manufacture of American glassware. Improvements in the making of pressed glassware have been made from time to time during the past century until we have the delightful shapes produced by the American manufacturers of today.

Space will not permit us to go far into the history of glassware-making in this country. At first it was necessary to establish the factories close to large forests where a continuous supply of wood for fuel could be obtained. This probably accounts for the early factories that were established in New Jersey at Glasborough, Bridgton, and other towns. Later, when natural gas began to be used as fuel in glass furnaces, these factories moved west to Pennsylvania, then Ohio, Indiana, Illinois and Oklahoma.

Some of these factories were too large to be moved around when the natural gas supply was exhausted and have had to fall back on gas which

they manufacture themselves from coal. This is the fuel used at the larger Ohio, West Virginia and Pennsylvania plants today; manufactured coal gas mixed with natural gas. It is very hot and an ideal fuel as any temperature desired may be maintained without fluctuation.

GLASSWORKERS

No history of glass however brief, would be complete without special mention of the glassworkers themselves. Probably from the time these workers were held almost like captives on the Island of Murano, they banded together in a very strong Union or Guild and for many years only a limited number of apprentices were taken in. This was very desirable from the Venetian viewpoint for the reason that the fewer men who knew the secrets of glassmaking, the less chance there would be of competitors starting in other cities and countries.

Glassworkers throughout the centuries have always been the aristocrats of artisans. In earlier days at Murano, they enjoyed some rare privileges. For instance, if the daughter of a glassworker married a nobleman, the latter did not lose his nobility and the children were considered of noble birth. This and other privileges were supposed to repay them for being held prisoners on Murano under pain of death if they left without special permission. Glass blowers were excellent skilled workmen and received from ten to twenty times as much as common laborers. The recent advent of machinery in glass manufacturing has lessened the strength of these guilds to some extent.

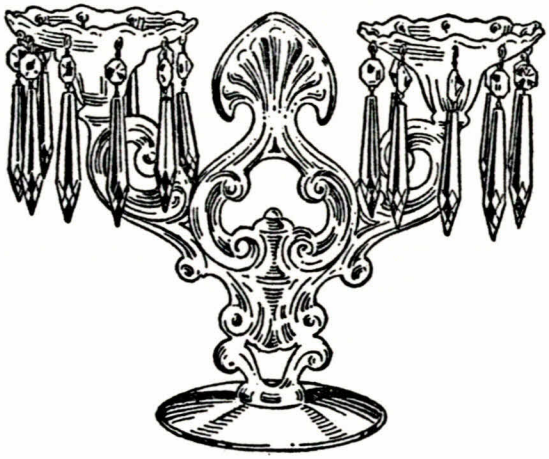
MELTING

There are two distinct methods of melting glass. In one of these methods large rectangular tanks are used. In this process the ingredients to be melted are fed in at one end of this tank through the 'dog house' and the melted glass is drawn out by workmen or machinery at the other end. Glassware produced in this manner is called 'tank glass' and is of the cheaper grade.

In the other method, pots are used instead of tanks. Fourteen of these pots (more or less) are grouped in a furnace and each pot is charged separately. When the pots are emptied they are recharged. During the process of melting, they are kept closely covered so that no soot or dirt may enter and discolor the glass. It is by this method that the finest glassware is made.

These crucibles or pots are made of fire clay, thoroughly glazed on the inside and allowed to season for several months before being placed in use. When first placed in the furnace these pots are 'warmed in'

gradually so as not to crack or otherwise destroy them. The life of a pot is problematical and to a large extent depends upon the kind of glass being made in it. All of the pieces of the old pots are saved and ground up to make other pots, as it seems the more this fire clay is used and burnt the better it becomes. Capacity of these pots vary but average around two thousand pounds of molten glass.



MATERIALS FOR CRYSTAL GLASS

The whole mixture of silica sand, cullett, potash, lead or lime, etc., ready for charging into the pot is called 'the batch'.

Silica

Silica sand along with cullett, (by cullett we mean broken up glass) forms the principal part of the batch. This sand should be very pure as only .06% of one per cent of iron can be covered up or neutralized by decolorizers and sand containing any higher percentage of iron than this cannot be used in making fine crystal glassware.

Silica sand is very abundant and is found in practically all parts of the earth, but a pure and suitable sand for making fine glass is not so generously distributed. A very pure sand is found in Pennsylvania, West Virginia and other parts of the United States. A good deal of care is used in preparing silica sand for fine glassware. It is ground up, thoroughly washed and calcined so as to remove all impurities and vegetable matter before being used.

Lime

Glass is divided roughly into two classes, lime glass and lead glass. Lime is used in the cheaper grades. The form used is common burnt lime with which we are all familiar. In former times lime rock, marble, or chalk, were used instead of lime. The purpose of lime in the manufacture of glass is to assume the role of alkaline earth element and the form mostly in use is granulated quick lime, but either quick lime or hydrated lime can be used. Molten lime glass usually has a very high viscosity.

Soda Ash

Soda ash or sodium carbonate is used principally as a flux to start the batch melting. It also helps to furnish the alkaline content.

Lead

Lead glass is usually the better, higher priced crystal. Lead oxide in the form of red lead is prepared by heating lead moderately in a current of air. It gives to glass many valuable properties, increasing density, resonance and refractive index. PEDDLE, a well known English authority on glass says that lead is necessary to secure color, density, brightness, durability, easy melting and easy working in glass. The softness of lead glass is advantageous in that beautiful designs can be more easily cut into it. Lead glass has a lower melting

point and is easier to plane and consequently freer from common defects such as cord and seed. The oxygen in lead oxide performs another function. This material has the highest specific gravity and therefore has a tendency to sink to the bottom of the pot, liberating the bubbles of oxygen which carry to the surface any impurities or unmelted portions of the batch.

Litharge

This material is prepared in much the same manner as red lead but has not absorbed as much oxygen and therefore it is not quite as valuable in the batch as red lead.

Potash

Potash is used together with lead in making the finest glass. This material acts as a flux in lead glass and imparts a resonance or ring.

Borax

Borax is sometimes used in the batch acting as a flux and also to form part of the alkaline content. It gives heat resisting qualities to the glassware.

Manganese

Manganese is used as a decolorizing agent to offset or overcome the greenish color caused by impurities such as iron in the batch. This greenish tinge in glass is called a 'low color'. If too much mangenese is put into the batch to overcome this low color, then the glass becomes pink or it is said to have a 'high color'. Manganese is also used to produce a purple or pink glass, but if allowed to get too hot turns the glass yellow or brown and finally green.

Arsenic

Arsenic is used as arsenous oxide or arsenate tri-oxide. Arsenic is associated with copper and is a by-product of the copper industry. It is used as a clarifying agent.

Other materials used in the manufacture of crystal glass are barium oxide, zinc oxide, alumina, feldspar, etc. Different salts and oxides may be used or left out, depending entirely upon the type of glass desired.

COLORED GLASS

People sometimes ask what kind of dye is used in coloring glass. They are under the impression glass is colored by some sort of vegetable dye. Color in glassware is produced by different mineral salts and oxides. The process of making colored glass is too technical and complicated to go into, except briefly, in a booklet of this nature.

Blue

Blue glass is produced by using zaffre, an impure cobalt arsenate made by roasting the crude ore or calcining it with excess air. This ore is found in Canada and Belgian Congo. Cobalt oxide and smalt are also used to produce blue glass.

Yellow or Canary

Cadmium sulphide is one of the materials used to produce yellow or canary glass. Cadmium, a metal never found free in nature, is silvery white in color and soft at ordinary temperatures.

Green

Oxide of chrome is used to produce certain shades of green. It is made from sodium dichromate which is produced from chromite ore and occurs in several countries, but the greater part comes from Asia Minor. Oxides of iron are also used in producing shades of yellowish green.

Amber

Selenium, cerium and flowers of sulphur are used to produce beautiful amber colors.

Red

This color is produced by selenium which is an element from copper ore and is a by-product of the copper industry.

Gold, used as 'purple of Cassiuus' produces a beautiful ruby glass, or the same material under different treatment can produce amber or purple.

In addition to the above materials, black oxide of copper is used to produce a blue green glass and copper is also used in producing red glass.

Red oxide of iron which is prepared from salts of iron either by precipitation or calcination is used to produce yellowish green glass.

Uranium, an element which occurs with radium in pitch-blende, used as sodium uranate produces a canary yellow florescent glass.

The above are only a few of the many materials used in producing beautiful glassware today. Sometimes several of these oxides are used in the same batch to produce a particular tint. Some of the oxides and salts are so powerful that only a minute quantity is required to give color to an entire pot of glass.

THE BATCH

The batch is most carefully made up, each ingredient is weighed or measured in the most painstaking manner. All of this is placed in a steel car in the mixing room which can be wheeled over to the furnace and charged into the pot. It requires twenty-four hours or more to melt and 'fine' this pot of glass. Fineing means to remove all of the bubbles and unmelted particles which may still be in the mixture. The molten glass is allowed to cool somewhat from the highest melting point so that the glass will be more viscous (about like taffy) and is therefore easier to work.

PRESSED GLASS

When the pot of liquid glass has been fined and is at the proper temperature it is ready to work. The workman takes a steel rod about four feet long called a pontil (or punty). He reaches the end of this rod into the pot of glass and, because the rod is cool, it immediately adheres and he withdraws a quantity of glass from the pot. He drops this into the mold which has already been heated in a mold oven.

The white hot glass is allowed to stream off the end of the pontil rod until another workman, who has charge of this part of the process, cuts the stream off with a pair of shears. This must be gaged very carefully as too much glass would overfill the mold and ruin the article being made, and too little would spoil it also. In cutting off this stream of glass with comparatively cold shears, there is always a mark left on the glass which the workman tries to place so it will be pressed out or at least so this mark will not show. Hence the phrase 'Shear Marks'. These are the small hairlike marks sometimes to be found in the bottom of a bowl or plate. They give the appearance of small cracks, but do no harm to the piece at all unless they are too prominent and in that case the article is rejected by the inspector.

The mold is made of two parts, the bowl part or receptacle and the plunger. After the hot glass is dropped into the mold the plunger is inserted and workmen by means of a lever exert pressure on the plunger that forces the glass to every part of the mold. Long experience and skill are their only guides in knowing when this pressure has been

exerted long enough, and the glass has been pressed out to entirely fill the mold. The plunger is then removed and the mold opened up, allowing the article just made to cool a few seconds before being taken out.

Very rarely is this article pressed into the shape that it is designed to take eventually. Therefore, it is usually placed on a tool called a 'stickingup punty'. This tool is made of iron and kept red hot. It has a table or base large enough for the article being made to adhere which it does for the reason that the glass is slightly melted by this hot iron. Besides the 'stickingup punty' there are many other tools to hold articles of glassware into the 'glory hole' for fire polishing and reshaping. A common one is called a 'snap', others have to be invented for unusual articles.

The next process is reheating in the 'glory hole'. The glory hole is an open furnace, very hot, where glass may be heated quickly both for fire polishing and for reshaping the article. When the proper temperature is reached the article is taken out of the glory hole and brought to a workman equipped with calipers, cherrywood or applewood finishers, and other tools. He gives the article any desired shape by deft application of these tools. The other workman rotates the article over a special device built for that purpose, while the finisher completes the shaping. The article is then detached from the stickingup punty and taken by means of forks or special tools which may be made for this particular item to the annealing lehr.

LEHR

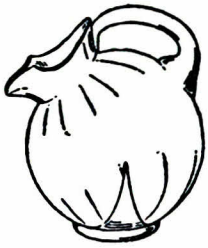
The purpose of the annealing lehr is to remove internal strains from the glass. Naturally when glass starts to cool, the surface cools much faster than the inside, thereby creating terrific internal strains, so that a slight blow or quick change of temperature would cause the glass to crack. It is therefore, carefully annealed. This is done by heating the surface of the glass up to a moderate temperature so the inside may expand.

The lehr is a long oven with a moving floor. The glassware in its passage through this lehr is alternately heated and cooled and comes out of the lehr at almost room temperature. The alternate heating and cooling of the glass in the lehr serves to remove all of this internal strain.

The glass is then inspected and is either packed for shipping or sent on to other departments of the factory for cutting, etching, or decorating.

GRINDING BOTTOMS

Some of the pressed pieces like bowls and plates must have ground bottoms. These pieces are taken directly from the lehr to the grinding machine which consists of a large revolving stone placed horizontally and the article is allowed to rest on the flat side of this stone until the grinding job is completed. Then it is washed and sent on its way the same as other pieces that do not have to have this extra operation.



BLOWN GLASS

The process of making blown glassware is entirely different from the process of making pressed ware just described. The molten glass is prepared in the same manner but the workman gathers the glass out of the pot on a blowpipe instead of a punty.

Now we will suppose that the turn or move calls for goblets. The first workman, who is called a 'gatherer' begins by shaping the blob of glass on a small flat steel table called a 'marver' and starting a small bubble. It is then passed over to the blower who stands up a little higher so he can work this glass on the end of a four-foot blowpipe with greater ease.

The bubble is blown a little larger and when it reaches the proper size is dropped into an optic mold which puts little ribs or creases in the hot glass. The whole bubble is then put into a paste mold which forms the shape of the goblet and the blower exerts as much pressure with his breath as is possible, thereby causing the glass to take shape inside of the mold. At the same time the blower rotates the glass in the mold which causes these optic lines that were at first on the outside to be virtually rubbed right through the glass so that when this bubble or bottle is taken out of the mold, the optic lines will be found on the inside. The workman is careful to rotate this bottle as much one way as the other so that the optic lines are straight up and down. Turning the glass all one way produces a swirl optic. This bottle has cooled

down somewhat but is still hot and in this stage it is passed over to a man who takes it to a machine where the stem will be pressed on.

While the blower and gatherer have been shaping the bowl of this goblet another crew of men has been molding a stem and they are ready when the bottle comes to them. The stem is pressed on while both pieces are hot.

We now have the bowl and stem of the goblet but no foot. Another man, however, has been getting a small quantity of molten glass out of the pot and is ready when the goblet reaches this stage. This small ball of hot glass is now stuck on the bottom of the stem and the finisher is ready to complete the goblet by smoothing out and shaping the foot with a cherrywood finisher, shaped much like a paddle. When this process is completed the goblet is still sticking to the original blowpipe but a slight touch with a cold iron removes it from the pipe and it is carried by forks prepared for that purpose immediately to the annealing lehr where internal strains are removed as described previously.

When this goblet comes out of the lehr it will be found to have quite a quantity of excess glass at the top. Therefore this glass has to be removed. It is first scratched with a diamond and then rotated in front of small hot jets of flame which touch the glass exactly where the diamond has made the small scratch. The top can then be lifted right off without effort and this excess glass goes into the cullett bin.

The top of the goblet is now very sharp and rough where it has been cut so it must be ground smooth on stones after which it goes into another lehr, called the 'glazing lehr', which shoots down hot flames from the top as it goes through on an endless belt arrangement that rotates the glass at the same time. This process glazes the top, fire polishes the glass, and completes the annealing all in one operation. The goblet is now washed up and is ready to be packed for shipment or go to other departments of the factory for further treatment.

The process of making a goblet with a pressed stem has just been described. In making a goblet with a drawn or pulled stem, the stem is drawn out from the bottom of the bubble. This is done with a tool which looks something like a pair of pliers. The bowl part is shaped in a paste mold as described above and then the foot is attached in the same manner as the foot on a pressed stem. Drawing this stem is quite a skillful piece of work and requires a great deal of training.

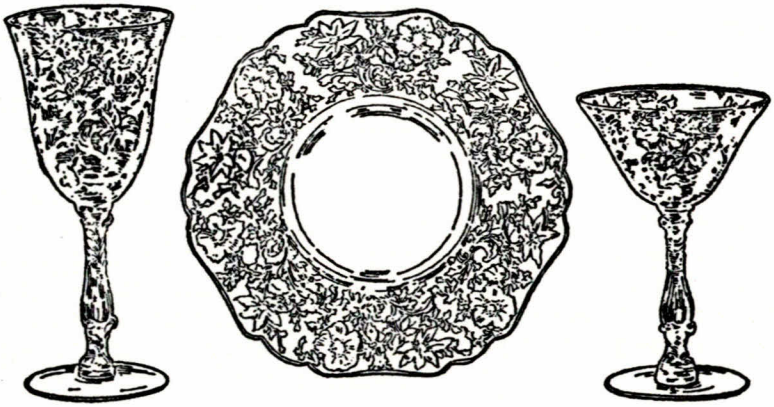
ETCHING

There are three general types of etchings made in this country. 'Needle Etching' is done entirely by machinery. The article to be etched is dipped in a resist wax and then placed in a machine where the points of needles cut off the wax in the design to be etched. 'Pantograph Etching' is done in the same manner excepting the needles follow a key pattern and the design on the glass may be made either smaller or larger than the key pattern.

The best etchings though are made by the 'Deep Plate' method. In this process the design is first engraved on a metal plate, then the wax or ink as it is called is put onto this plate and all of the wax scraped off except what is contained in the design cut into the plate. A special tissue paper is then laid on the plate and all of the wax in this design sticks to the paper and comes out when the paper is pulled off. This paper is then placed on the glass where the wax hardens and the paper is then moistened and taken off. This leaves the original design on the steel plate transferred onto the glass.

All parts of the glass are coated with wax except the design to be etched and the article is then taken to the Acid Room where it is immersed in hydrofluoric acid which eats away the exposed glass thereby creating the design.

The glass then goes into automatic washers where it is heated by steam and boiling water and the wax is removed and reclaimed so that it can be used over again. The glass is then carefully inspected for acid spots, thoroughly polished with sawdust and wrapped for packing.



CUTTING

Engraving or Cutting is done by highly skilled workmen who follow designs placed before them or stenciled on the glass and seem to be able to cut any kind of design wanted, much as an artist would draw a picture with a pencil. The tools for doing this work are rapidly revolving carborundum stones of different sizes on which is poured a constant stream of water, or they may use copper wheels that are supplied with a stream of emery dust and oil.

When this glass comes from the cutting room all of the cutting is grey. These cuttings may be polished in two ways, either by buffing wheels or by immersing in a solution of hydrofluoric acid. The acid method is almost universal in America. This acid dissolves a portion of the surface, smoothing it out, which gives it a polished, brilliant appearance and is more satisfactory in a lot of ways than the old style buffing process which if not done carefully causes spreading or pulling of the design and distortion of the pattern. After polishing the glass is carefully inspected and washed.

ROCK CRYSTAL

Often the question is asked "Is this genuine Rock Crystal"? Strictly speaking, no glassware is Rock Crystal. The only rock crystal is the natural quartz as Mother Nature made it. Large pieces of quartz have been formed into cups, chalices and small bowls. A few of these are to be found in museums, so if one desires to be absolutely correct, these are the only pieces of genuine Rock Crystal. However, in common usage glassware that has been cut and polished is called Rock Crystal.

Others ask the question "Is this Crystal or is it just Glass"? It is generally understood, Crystal refers to the color of glass and not to its quality, so what the party intends to ask is, "Is this cheap crystal or is this good crystal"?

DECORATING

There are several types of metal decorating on glassware. One type called Silver Deposit is made in the following manner. The base metal is put on the glass much after the process of Etching and then burnt onto the glass; after which it is placed in an electro-plating bath and is plated by means of electricity, just the same as any other silver plating process. This Silver Deposit may be rendered practically tarnish proof by plating over it with rhodium.

Gold is put on with a brush sometimes laid down into an etched design after which it is burnt onto the glass in the decorating kiln and then burnished.

Platinum is put on in much the same manner, but requires a much hotter fire and therefore a special glass that will withstand this extra heat is required for all platinum decorations.

Enameled decorations are painted on or may be put on by a new screen process and the enamel is then burnt into the glass in a decorating kiln so the painting will be permanent.

There is such a thing as cold decorations, that means colored painting on glass that has not been fired. This is a cheaper decoration.

SELECTING

Now in selecting glass for your home, the first consideration should be the shape or type to harmonize with the chinaware or other furnishings in the room where the glassware is to be used.

Often the question is asked, "Isn't Crystal always the most appropriate and best glassware to buy", and the answer is "No". If a color will best suit the motif in the room and on the table where the glassware is to be used, then of course that is what you should select. Glassware is something you will live with for years so any extra time or care you spend in selecting it, will be a good investment.

Not much can be said about choosing colored glassware. The colors should be nice and clear and without too many flaws but please do not pay too much attention to small flaws in glassware. You know Mother Nature could make only a very small piece of perfect crystal so do not expect too much of mere man. All glassware has small flaws but glassware with noticeable or large apparent flaws is selected out and broken up by the better factories.

In selecting crystal glass much more can be said. The first requisite in crystal glassware is color. If it has a muddy or yellowish appearance the amount of cutting or decorating avails nothing. The color should be like clear spring water or a fine diamond, or as near like that

as one can get. A good resonance or ring is desirable for the reason that this denotes the glass contains lead and potash. Lime glass has very little or no ring. Another thing to be considered is the amount and kind of decorating on the glass. First and above all in choosing glassware I would put color and brilliance.

CARE

After you have chosen a fine piece of glassware representing all of the artistry and development of thousands of years, please give it the good care it deserves. For instance, do not hold a fine piece of stemware under the hot water faucet as this puts too much strain on the glass from expansion caused by the quick application of heat.

If you are using glass cups and saucers, put a spoon in the cup before pouring any boiling liquids. This will at least give it a chance. If you put ice cream on a glass plate, be sure there is a small paper doily or something under the ice cream. Putting a dipper of ice cream on a bare glass plate is the surest way in the world to break it unless it is a very good quality and has been thoroughly annealed.

If your glassware has a metal decoration, do not use ammonia or caustic washing powders at all as this kind of treatment will dim the polish on this metal and may cause it to come off entirely. Wash all metal decorated glassware in mild soapsuds. A mild solution of ammonia is all right to use on plain glassware but not on metal decorations.

In handling glassware, the edges should not be allowed to bump together at all; this will cause nicks as no doubt you have discovered. If you are so unlucky as to get a large nick in one of your best water goblets, the only thing to do is discard it, but if the nick is a very tiny one you may take a piece of 00 Emery Paper wrapped around a small round object like the handle of a tack hammer and with much patience and perserverance by working this emery paper backward and forward across this nick, you may grind it off smooth. You will find, however, in this process it leaves the edge of the glass frosted in appearance. You can polish up this frosted appearance by putting a little polishing rouge on a leather strap and working it back and forth the same as you did the emery paper. This is only recommended for pieces of glass that cannot be replaced or those pieces that have sentimental associations.

CORRECT TABLE SERVICE

Articles for table setting should be arranged as follows:

A. Napkins:

1. Placed to the left of service plate.
2. Folded so as to show their embroidery to the best advantage.

B. Silver:

1. Knives, spoons, oyster forks to the right of service plate.
2. Other forks on the left.
3. Sharp edge of knife should face the plate.
4. All silver should be arranged according to order of its use; those to be used first to be farthest from the plate.
5. All silver required up to dessert course should be on the table at beginning of meal, unless, besides oyster fork and butter knife, more than three knives and three forks will be needed, the extra silver should be brought in when needed.
6. Butter knife should rest on butter plate, parallel to edge of table (may be omitted at a formal dinner).
7. Dessert silver usually brought in with the dessert or may be placed just before serving.

C. Placing:

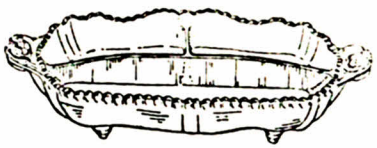
The edge of service plate, tips of handles of all silver and edge of napkin should form a straight line one inch from edge of table. Covers should be opposite each other. The standard spacing for the covers is 24 inches from center of next. Varies with size of table and number of guests.

D. Glassware:

1. If there are three glasses, it is usual to arrange them in a triangle. Water goblet in front of knife.
2. All glasses should be filled only ¾ full.
3. Wine glasses are removed after each course if different wines are being used, if same wine is used then glasses are refilled just before each course is served.
4. Glasses should not be lifted from the table when being refilled.
5. Service plate—This is removed just before the main course is served.
6. Salad plate—If salad course is served with the main course, the salad plate is placed on the more convenient side, as there are usually several glasses on the right side, the left side is more suitable.

7. Courses are removed only to be replaced immediately with next course. There must always be a plate before the guest until dessert is ready to be served, when table is cleared of all silver and dishes, table crumbed and dessert brought in.
8. Fingerbowls:
   (a) If needed after fruits at beginning of meal or after any food that demands use of fingers, fingerbowls may be placed to the left of the cover when table is laid—or it may be brought in toward the end of the course and placed to the left of the cover.
   (b) If dessert plate and fingerbowl are served together, the fingerbowl is placed on the dessert plate and dessert silver is placed on the sides of the plate (fork on left, knife or spoon on right). The guest removes the silver, then the fingerbowl, which he places at the left of the cover.
   (c) If dessert is served in individual portions, the fingerbowl on a plate with a doily is placed in front of the guest after the last course.

E. Different types of service:
1. Russian Service.
   Food served from the side in individual portions or from serving dishes for each guest to help himself.
2. English or family service.
   All food belonging to one course is placed in serving dishes before the host or hostess and served from table.
3. Combination Service.
   Soups, salads or dessert served from the kitchen and the main dish served from table.



CORRECT BEVERAGE SERVICE

The proper blending of wine with food is an art thoroughly understood by few and has as many variations as there are great connoisseurs. All that we can do here is to give the general outline which must be followed by all who would enjoy this greatest of beverages to its full.

The following rules are almost invariable:

White wines should be served cold.

Red wines should be served at room temperatures or a little below.

Champagne and sparkling wines should be iced.

Dry wines should be served before sweet wines.

Light wines of lesser alcoholic content before rich wines of a higher percentage of alcohol.

Young wines should be served before old wines except in cases where the old wine is a more delicate flavor than the young.

In general, the order of wines should be from white to red, from light bodied to heavy bodied and from dry to sweet.

Wine glasses should not be filled more than three-quarters.

It is important to decant red wine carefully. This is done by standing the bottle upright for several hours which will allow all the sediment to settle at the bottom. When the cork is removed carefully the wine may be poured off leaving the sediment in the bottle.

An old custom is to have the wine served first to the host so that he can see if it is sound and of proper temperature before serving the guests. It is then served to the right.

A napkin is used to wipe the mouth of the bottle which is then wrapped around the neck so as to absorb any overflow.

Glasses should be refilled before they are completely empty, unless the guest indicates otherwise. Glasses are not lifted to be refilled.

Wine for the next course is served immediately after removing plates of the previous course and before placing the next course.

In no case is ice ever put into the glass.

WINE GLASSWARE

White wines should be served in from four to five ounce glasses. Shape of bowl and height of stem are matters of personal taste.

Rhine wines or moselles look well in a tall stem hock glass or roemer with characteristic curved-in bowl.

Special glasses are made for sauternes; however, this wine may be served with good taste in a roemer or four to five ounce stemmed claret.

Sherry, Madeira and Port are generally served in two ounce to two and one-half ounce glasses, although some prefer a three ounce glass for Port.

The favorite glass for Champagne seems to be the saucer shape, hollow stem, although the regular saucer champagne without hollow stem is in quite as good taste.

Claret, Burgundy and similar wines are properly served in a four to five ounce stemmed claret.

A special glass with hollow stem is made for a sparkling Burgundy although this wine may be served in the regular claret glass also, or hollow stem champagne.

Cognac and Brandy may be served in one ounce stemmed glasses or the larger brandy inhaler.

Cordials should be served in one ounce glasses, preferably with stems.

All wines should be served in stemmed glasses.

The only glass served on the table at a formal dinner, which may not match the water goblet is the hock or roemer. All other glasses must be of the same pattern as the water goblet.

If brandy or liqueurs are served with coffee after dinner in another room, naturally these glasses would not have to match the general service.

WHEN TO SERVE BEVERAGES

WITH APPETIZERS—Cocktails, or Sherry and Bitters, served in the reception room.

WITH OYSTERS OR LITTLE NECKS—Sauterne, Chablis.

WITH SOUP—Sherry.

WITH FISH—Rhine Wines, Moselles.

WITH ENTREE—White Claret, White Burgundy.

WITH ROASTS—Red Claret, Burgundy.

WITH FOWL OR CERTAIN GAME—Champagne.

WITH PASTRY OR DESSERT—Madeira, Sweet Champagne, or Chateau Yquem.

WITH CHEESE—Port.

WITH FRUIT—Tokay, Malaga, White Port.

WITH COFFEE—Cognac, Brandy, Liqueurs.

The above suggestions are offered only in a most general way, as the kind of soup, entree, roast, fowl or game, might change the type of wine to go with it. Also it is quite correct to serve one wine throughout the entire dinner. In the old days when many hours were required to consume these multiple course dinners a variety of wines was most appropriate.

DELMONICOS MENU

(Reprinted by permission of John Willy, Inc., publisher of the Hotel Monthly)

Since Delmonicos' probably represented the apex of Epicureanism as attained in the United States, a menu by Charles Ranhofer, steward of Delmonicos', is reprinted.

SERVICE OF WINES AND CORDIALS

The steward must inform and specify to the butler the wine to be served at each separate course. However important the dinner may be, still decanters of ordinary red wine must be placed on the table. The selection of the finer wines is the host's duty, he making the choice when ordering the bill of fare.

The steward's duty is to see that the wines are served at a proper temperature.

All white wines must be served cold.
Sherry and Xeres cool.
Bordeaux between 55 and 60 degrees.
Champagne, cold or iced, or in sherbets.
Dessert wines cool.

For choosing wines consult the table on wines of Delmonicos' cellar (No. 3709)

RUSSIAN SIDEBOARDS—Absinthe, Vermouth, Bitters, Kummel, Mineral Waters, including Apollinaris, Clysmic, St. Calmier, and Vichy.

FIRST SERVICE

WITH OYSTERS—Sauterne, Barsac, Graves, Mont Rachet, Chablis.

AFTER THE SOUP—Madeira, Sherry or Xeres.

WITH FISH—Rhine Wines (Johannisberger, Marcobrunner, Hochheiner, Laubenheiner, Liebfraunilch, Steinberger, Moselle), Brauneberger, Zeltinger, Bercasteler.

WITH REMOVES—Cote St. Jacques, Moulin-a-vent, Macon Clos de Vougeot, Beaune.

WITH ENTREES—St. Emilion, Medoc du Bordelais, St. Julien, Dry Champagnes for certain countries.

Iced punches and sherbets, rum, madeira.

SECOND SERVICE

WITH ROASTS—(Burgundies) Pommard, Nuits, Corton, Chambertin, Romanee Conti.

COLD ROASTS—Vin de Paille, Steinberger.

WITH HOT DESSERTS—Bordeaux (Chateau Margeaux, Leoville, Lafitte, Chateau Larose, Pontet-Canet, St. Pierre, Cotes de Rhone, Hermitage and Cote-Rotie)

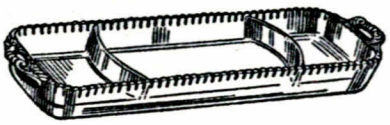
Red Champagne (Bouzy, Verzenay, Porto Premiere.)

THIRD SERVICE

WITH DESSERT—Burgundy (Volnay, Nousseux.) Champagne (Delmonico, Roederer, Rose Mousseux, Pomery, Cliquot, Perrier-Jouet, Most, Rhum.)

WINE LIQUORS—Muscatel, Malaga, Alicante, Malvoiste, Madeira, Lacryma Christi, red and white Cape, Tokay, Constance, Schiraz.

CORDIALS—Curacoa, Kirsch, Cognac, Chartreuse, Marashina, Prunelle, Anisette, Benedictine.



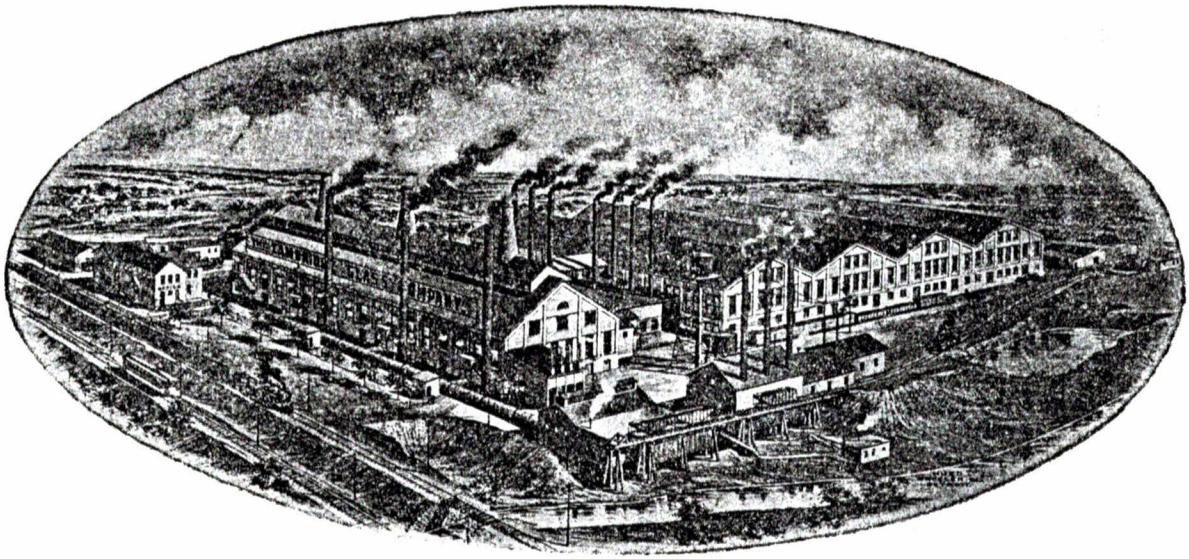
(The following appeared in a recent catalog issued by The Palmer House and is hereby reprinted by special permission of Palmer House Products, 118 South Wabash Avenue, Chicago)

A GUIDE IN SERVING

In the matter set forth below, we have not attempted to go into the many intricacies which appeal only to the occasional gourmet. Nor do we wish to convey the impression that it is not possible, or proper, to serve a single wine through an entire meal. On the contrary, a single wine, a Champagne, Sauterne, Rhine, or red wine, can be used with nothing else, with entire propriety and complete satisfaction to yourself and your guests. If more than one is desired, a good rule is to serve the driest first, or a white wine before a red.

Course	*Wines*	*Temperature*
Appetizers	Cocktail	Iced
	or Dry Sherry	Very slightly cooled
	or Vodka	Ice cold
Oysters	Chablis	Cooled
	or Rhine	Cooled
	or Medium Sherry	Room Temp.
Soup	as a general rule— nothing	
Fish or	White Burgundy	Cooled
	or Light Claret	Room Temp.
	or Dry Sauterne	Cooled
Entrees	Heavy Clarets	Room Temp.
Roasts, Steaks,	or Red Burgundies	Room Temp.
Wild Game, Etc.		
Chicken or Turkey	Red Burgundies	Room Temp.
	or Med. White Wines	Cold
Unroasted meats	Champagne	Iced
Dessert	Sweet Sauterne	Cold
	or Tokay	Very slightly cooled
	or Sweet Madeira	Room Temp.
Coffee	Liqueurs	Room Temp.
	or Cognac	Room Temp.
	or Old Port	Room Temp.

The Home of Cambridge Glass



THE CAMBRIDGE GLASS COMPANY

Capital $1,000,000.00

Incorporated 1901

CAMBRIDGE, OHIO, U. S. A.

HISTORY OF THE CAMBRIDGE GLASS COMPANY

The Cambridge Glass Company was founded by Arthur J. Bennett at Cambridge Ohio in 1901. He came from New York to take charge of this unit of the National Glass Company, which was being constructed at Cambridge because of the supposed abundance of natural gas. This supposition proved to be only partially right and eventually led the company into difficulties from which Mr. Bennett rescued it in 1907, taking over entire ownership of the factory at that time.

From the very first Mr. Bennett began gathering around him a staff of young men, little known in the glassware industry at that time, but who were destined to grow up with Mr. Bennett and the Cambridge Glass Company to assume leadership in this field. This staff absorbed enough of the "Bennett Philosophy" so that all worked together in one harmonious unit, which no doubt, to some degree, accounts for the great success of the Cambridge Company. It is noteworthy that this staff as first collected by Mr. Bennett is still intact and they have all become officials in the firm.

"Bennett's Boys" are, W. L. Orme, Vice-President; W. C. McCartney, Secretary and Salesmanager; G. Roy Boyd, Treasurer; J. C. Kelly, General Superintendent; H. A. Lovelady, Assistant Salesmanager.

Most of the present Cambridge salesmen and many of the factory workmen came with the firm in the early days. The turnover of help at this factory has been and still is almost nil.

Mr. Bennett and his associates are all typically American business men, the Cambridge factory is conducted in a typically American fashion and it is no wonder that such men and such a plant would turn out a typically American product to please the tastes of the American people; also the output of this factory has been and is of such unusual merit that much of it has been exported to all parts of the world.

While the output of the Cambridge plant has always been considered good quality, in 1917 Mr. Bennett and his associates decided to discontinue all of the common grade lines they were then making and turn their entire attention to high quality merchandise.

Cambridge has now become one of the greatest "hand-made" glass factories in America and it is worth noting that artificially attracting buyer interest through national advertising has never been done. Relying solely on original designs, beautiful colors and obvious quality Cambridge glass has by its own sheer worth and attractiveness built up this huge business. Mr. Bennett and his associates have a right to be proud of this unique record.

All of the glassware at the Cambridge plant is made by hand. There are three regenerative furnaces of fourteen pots each and all of the

necessary lehrs and equipment to organize a working force on a day and night basis. At the present time fourteen different colors are being produced regularly and in addition to that several other colors by special contract. Both blown and pressed glassware are made at Cambridge, to which are added nearly all types of decorations. The etching department is one of the largest and best equipped in this country. There is also a large cutting department and all cutting is done by hand. Gold, silver and enamel decorations, for which Cambridge has been famous for years is done in a large daylight department especially designed for this purpose. Only the best quality and highest standards prevail throughout all departments of this large, modern plant.

In 1930 Mr. Bennett issued a general letter to the trade from which the following quotation is taken, "If there is one thing we prize more highly than all others, it is the confidence our patrons have in CAMBRIDGE STANDARD QUALITY.—Cheap goods mean not only goods of inferior quality and worth, but low wages and a cheap and inferior standard of living for the people who make the goods. It cannot be otherwise.—We feel that we would not be keeping faith with our friends and patrons if we lowered our standard in the slightest degree."

Visitors are always welcome at the Cambridge factory, buyers and users alike. All will receive the utmost courtesy and be taken through the entire factory. A tour of this kind showing the many operations of making fine glassware is most interesting and educational.

First Piece of Glass Made at the Cambridge Factory