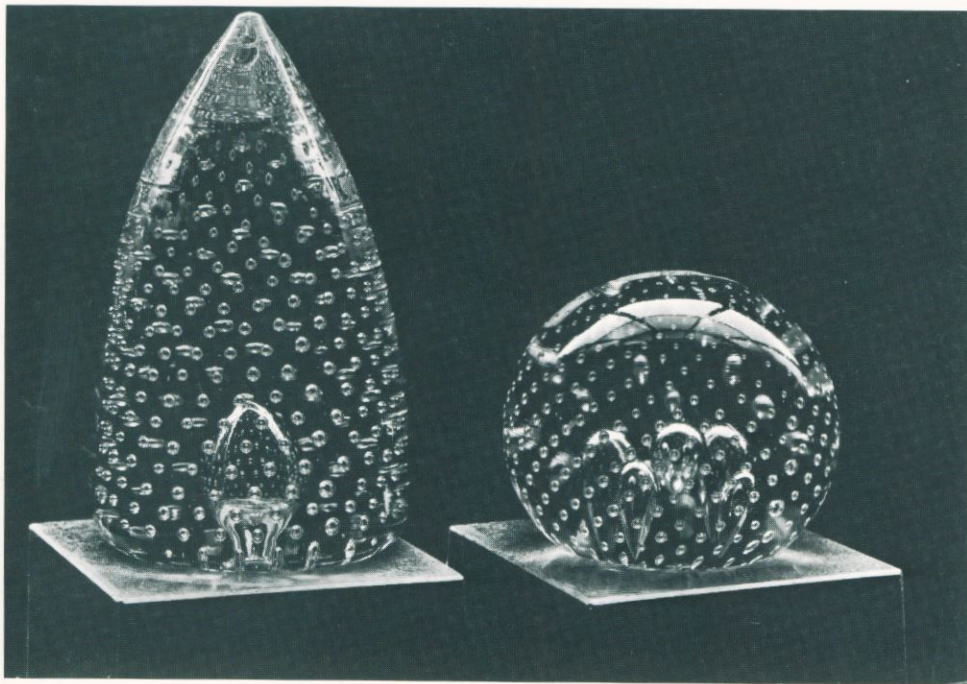


## Bubbles

Bubbles in glass have long annoyed glassmakers striving for clear, flawless glass. Carder loved bubbles—he said they “gave life to the metal,” and he often used them decoratively either in controlled designs (Ill. 104) or random arrangements (Ills. 105, 106).

Controlled bubbles were made by two methods: flat spike molds and two-piece hinged iron molds. The former were wooden slabs about an inch in thickness, varying in size from about four to eight inches in width by about twelve to eighteen inches in length. Iron spikes were driven through the slabs to protrude about one-half inch above the surface, arranged in the desired bubble pattern. The slab was placed on the marver, where the molten gather was rolled



**Ill. 103.** AMETHYST SILVERINA AIR-TRAP VASE, No. 6545 variant; height, 7 inches. Made in the 1920s. Rare in this color. Collection of Dr. and Mrs. L. G. Wagner. Raymond Errett Photograph

**Ill. 104.** LUMINORS, solid crystal glass with controlled bubbles; mounted on square black glass bases containing light fixtures. About 1928. PINEAPPLE, No. 6971; height with base, 10 inches. BALL, No. 6821; height with base, 7 inches. These were often sold with blue and red glass disks about 1/16 inch in thickness, which fitted into a metal ring inserted into the black base below the luminor ball or pineapple, to give a colored light. Steuben Catalog Photograph



**Ill. 105.** SMOKE CRYSTAL BOWL with random bubbles, No. 6118; diameter, 10 inches. Made in the late 1920s. Private Collection. Smithsonian Institution Photograph



**III. 106. FAN VASES, No. 6287;** heights 8¼, 6¼, and 4¼ inches. Made in a variety of colors with random bubbles, engraved decorations, and plain. Popular items of the 1920s. *Photographs from Carder's files*



**III. 107. COLOGNE BOTTLE, probably unique;** height, about 6 inches. Black and white Cintra center is surrounded by a heavy clear colorless glass casing with random bubbles. Facet cut. *Collection Dr. and Mrs. L. G. Wagner. Raymond Errett Photograph*

over it. The spikes impressed a pattern in the surface of the hot glass, and another gather of glass was then applied to lock in the air and form the controlled design.

The same effect was also obtained by an iron mold, either in the form of a dip mold or an open-and-shut hinged mold, with spikelike projections in the desired patterns on the inside. These produced impressions in the hot glass that formed the controlled bubble design when covered with another gather of glass.

Random bubbles were produced in Carder Steuben glass by an unbelievably simple process known as "sticking the pot." Just before bubbled wares were to be made, a freshly cut willow pole about two inches in diameter and four to five feet long was pushed into the pot opening and through the molten glass to the bottom of the pot, then was withdrawn almost at once. This sudden introduction of green wood caused the glass to bubble as a result of the gases released, and gathers of glass taken for the next half hour or so would contain bubbles of various sizes. The process was repeated as often as necessary to keep the glass bubbly.

Carder also used this process to change the color of the glass in the pots. A greenish tint resulting from iron impurities in the sand used in mixing the batch was eliminated by adding manganese to the molten glass. The right amount of manganese would eliminate the greenish tint and produce a clear, colorless glass. If too much manganese was added, the glass acquired a pinkish tint. When Carder saw pinkish samples he would order, "Stick the pot with a withy pole," and the same procedure as that used for producing random bubbles was used, thus lessening or eliminating the pink tinge. Sometimes it was necessary to "stick the pot" more than once to eliminate the pinkish color entirely and produce colorless glass. The supply of fresh willow poles was replenished by sending a factory workman out to cut new ones from the willows growing on the banks of the nearby Chemung River.

### *Cintra*

Cintra glass was produced by rolling a molten gather of crystal glass over powdered glass (or frost) of various colors, which had been spread on a marver.