OPTICAL SCIENCES CENTER
OSCillations

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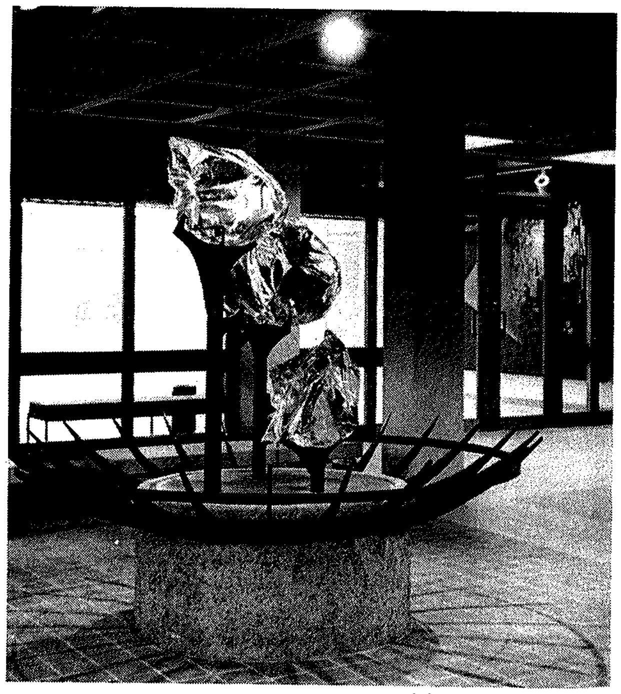


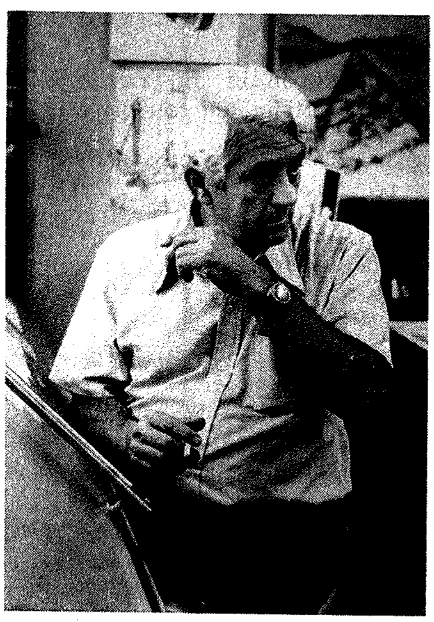
(Photo by George Kew)

"OH, YES--THE BUILDING WITH THE GLASS SCULPTURE!" Most visitors to the UA campus can easily locate the Optical Sciences Center, because they identify it with the glass sculpture by OSC artist *Don Cowen* that graces the portico. But few admirers of the sculpture are aware of the story behind it or of the significance of the sculpture and the material of which it is made.

The material itself is Pyrex glass--from a piece of cullet presented by Corning Glass Works to the Optical Sciences Center in 1967, two years before completion of the present OSC building.

"Cullet" is broken or waste glass suitable for remelting, and this particular cullet originated as part of the last melt of one of the glass tanks in the Corning glass factory. A "tank" in this case was one of the gigantic production-line furnaces that was used to melt glass for Pyrex cookware. (Little Pyrex is made these days, as the more popular Pyroceram material now is the basis for most of the cookware Corning is making.) Just before a tank was considered to be worn out, it was filled with a special glass melt, of slightly different composition, that was suited particularly for use in telescope mirrors. The special glass melt was allowed to cool in the tank, and after it hardened, it was "mined" out. The broken pieces of "telescope glass" were then stored along the river bank near the factory, waiting for final remelt into mirror blanks, as the demand occurred. Meanwhile, the tank itself was relined with fire brick in preparation for a new life cycle of melting glass.

The piece of cullet that eventually ended up at OSC, says *Aden Meinel*, dates back nearly to the time of the melt that supplied the Pyrex glass for the 200-inch primary mirror of the Palomar telescope, the world's second largest astronomical telescope. Aden spotted this particular piece among others that lined the river bank, and realized it might have some use in the soon-to-be-built Optical Sciences Center. Shortly thereafter, the Corning company presented it to OSC--all 3300 pounds of it--and the rest of the story is the story of its transformation to a work of art.



OSC artist Don Cowen

The task of creating an esthetic sculpture from this massive chunk of glass fell to OSC artist Don Cowen, who had joined the OSC staff in 1965 with much prior experience in painting and sculpture, and who was attracted to a job at the Optical Sciences Center for the opportunity to combine art and scientific illustration.

When he first saw the glass--"It was about the size and shape of a desk," he recalls--Don's first thought was that it didn't suggest anything very esthetic. "I wondered how it could be made to fit the porch. I did some sketches using the single piece. Nothing pleased me. The more I looked at it, the more I started to become depressed."

In any case, he realized, he would have to learn how to work the material, and he turned his energies to that. The glass was moved to the 22nd Street Annex, a large warehouse at Cherry and 22nd Street that at that time and for several years afterward housed various support activities of the OSC. Don had worked with metal and stone before, but glass was new to him. "After blunting a couple of chisels, I arranged with *Charlie Burkhart* [head of the instrument shop at that time] to get me some tempered steel chisels." But these didn't work either. "The only way to sculpt glass, I found, was to split it. There was no way to chisel it. All you'd get by chiseling would be crushed and powdered glass and flakes." And splitting the glass, he reasoned, should be easiest if done along planes of stress.

He began talking with *Dick Sumner* about stress patterns in Pyrex. "With Dick's help I got two large sheets of polaroid material, one on each side of the glass, and we could actually see the planes of stress in it. I began to make sketches of these and studied them to see whether I could split the glass along these planes. This was actually the first sculpting design study. I did several design studies of these planes in the block. I had tried everything I could with the single piece, and now I was beginning to see the forms in it--as if the block had forms in it that could emerge and be beautiful. I began to consider the idea of several free-form pieces."

But the glass still refused to be worked. "Just about the time I'd broken my last tempered chisel, I got the idea of using an oxyacetylene flame to create stress. I was using a fine, sharp blue point with the flame, but I wasn't splitting any glass off--only melting it."

Now ready to try almost anything to get some action, he raised the glass slightly with a crane and then lowered it back down onto a wedge. Tentatively, he hit the glass in the middle with a hammer. And then again--

"It burst, with a loud boom! Pieces of glass flew 40 feet, and everyone rushed out of the offices to see what had happened." (Aden Meinel recalls today: "It was a shock to Don and me both when he telephoned me that the glass had exploded on him. He could have been killed!") The reason for the explosive breakup was that the glass cullet had not been annealed. Annealing is a heat process that relieves the stresses that have built up in the rapidly cooling cullet, and prevents just such incidents as this from occurring.

(Photo by George Kew)

But now that he had his smaller blocks--three large ones, plus innumerable fragments--Don was free to expand his design ideas to an arrangement of free-form pieces.

"I drew a rough sketch of what I thought I'd like, similar to the design you see today. I wanted to make a large spiral structure, rising from a form reminiscent of a large mirror support."

Then he went back to the glass. Perhaps because he was now working with smaller pieces, "I was able to split it using the flame. I devised a 'hit-and-split' method, and using the flame alone I began to chip small pieces off wherever I wished. Luckily, I hit the one largest piece the way I wanted and got an extra piece to use as a reserve--I think it's still around here somewhere."

As he began to get better control and knew he could handle the material, Don finalized the plan of the sculpture. He specified to the building architects the substructure that would be needed and the overhead lighting that would enhance it. "By then, it was a sculpture. Before, it was a block of glass."

As he finished shaping the blocks, Don added some texture to contrast with the smooth planes on the glass, by deliberately roughening the glass in places with a miner's pick. And finally, he burred off any remaining sharp, cutting edges with a heavy-duty belt sander.

As he'd explained, the feeling of a mirror support is intrinsic to the design. "This is suggested by the dish-shaped steel structure below the glass," he says. The metalwork was done by *Dave Zachary* of the instrument shop. The concrete base was poured by a subcontractor.

The sculpture was assembled on the site where it now stands. First the steel collar and support posts were attached to the concrete base, and then the glass pieces were lifted on and secured with steel pins.

The final result is a piece of art custom made for its setting. The irregular shapes of the glass pieces contrast with the perpendicular angles in the building entrance. The ribbed steel guard rail echoes the ribbed effect of the entrance canopy and the ceiling of the lobby, and the concrete drum that forms the base ties the sculpture to the texture of the quarry tile entrance floor and the surrounding concrete building structure.

The sculpture has drawn comments and admiration from OSC employees and visitors alike. And Don himself is pleased. "The big thing for me was the stimulating research and discovery that went into it. I feel it was a tremendous effort, well worth it. And it looks better to me today than it did after I finished it." Does he plan to use the experience gained for another glass sculpture? The answer is unhesitating and final. "Never," he says.

CONGRATULATIONS to *Poohsan Tamura*, who passed his PhD oral June 4. His dissertation is on "Feedback Systems for Image Acquisition and Processing." Poohsan is now with Honeywell in Minneapolis, Minn.

IT'S TIME TO RENEW YOUR VALIDATION on your faculty-staff identification card. Take your card to *Alfrieda Harding* so that you can get the 1979-80 sticker that brings it up to date.

NEW FACES: Two new secretaries joined the staff of OSC last week. On the fifth floor is *Sherrie Cornett*, who's working with *Bob Shannon*'s group. Sherrie is a native of Arizona (Phoenix), who most recently comes from Flagstaff, where she was secretary for a book-publishing company. The move to Tucson is to enable her husband, *Zane*, to begin a PhD program in Forestry here at the UA--after which they hope to return to the Flagstaff area. Sherrie's favorite spare time activities are sewing, reading, and horseback riding. You can reach her at ext. 6-3157, room 501.

Sherrie Cornett

Rose Bennett

On the seventh floor (room 704, ext. 6-1276) is *Rose Bennett*, who's originally from Indiana, has worked for Owens-Corning Fiberglass in Ohio and in Los Angeles, and who came to Tucson (on April 1) because she has friends here and likes the area. Rose likes swimming, water skiing, and snow skiing, and just now is beginning a new activity--something she's always wanted to do--piano lessons. "I've just rented the piano, and my first lesson is tonight!" Good luck, Rose--and welcome to both Rose and Sherrie.

VISITORS FROM KOREA AND FROM CHINA have recently toured the OSC. On June 5 and 6 and today, a delegation of seven remote sensing scientists from Korea visited the UA as part of a working session involving various laboratories in the U.S.; the goal has been to identify areas of mutual interest and possible future collaboration. The leader of this delegation, *Dr. Sang Soo Lee*, had visited the OSC previously, when he was here two summers ago to consult with *Phil Slater*.

Two laser scientists from the People's Republic of China toured the campus yesterday with *Peter Franken*. One of them, *Prof. Wang Zhijiang*, Vice Director of the Shanghai Institute of Optics and Fine Mechanics, Academia Sinica, gave a colloquium in the afternoon on "Laser Research in China."