

The Glass Art Society
Journal

Pacific Crosscurrents

1994

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Introductory Remarks

John Leighton: Welcome to the 24th Annual Glass Art Society Conference.

Mary and I have been working with the G.A.S. board and staff, local advisors, and dozens of local volunteers for two years to help make this Bay Area conference a success.

Some may wonder how a conference is planned. The board selects sites about three years in advance. Then, two years ago, a group of about twenty-five Bay Area glass artists met at John Lewis's studio. There the planning began.

Mary and I wonder how tonight we can summarize these two years of planning, and how we can express our gratitude to the many individuals who have given great parts of their lives to this process, and we realize that there just isn't time to thank everyone. We hope that all of the local committee members and volunteers felt the same spirit of family that we've felt, and are confident that all of you in attendance will feel this has all been worthwhile.

I give a special thank you to Mary, to Marcia Kosteva, our conference planning assistant, and, oh yeah, thank you, Marvin.

Mary B. White: Planning the G.A.S. conference has for me been a roller coaster of learning and growth. I've probably made more decisions, more mistakes, and hopefully more successes in this time—and I thought as an educator grading papers was tough.

We wanted to bring to you an interesting mix of people and presentations about the material we all love so much, glass. So many of the special events planned for this conference—the open studio day, the wonderful "Benicia Day" studio tours, the student exhibition, the San

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Jose State University workshop, and the fifty-one galleries, museums, and exhibition spaces that are showing glass—are the results of the wonderful help and work of the committees comprising over 250 glass artists, educators, and students. We sincerely hope all the events are as exciting for you to attend as they were for us to plan.

None of this could have happened without the Oakland Advisory Committee. I sincerely thank all of the members who contributed so much. I also want to give special thanks to Ruth King, who worked with me the first year as site coordinator before she left the Bay Area.

We thank you for coming. Have a wonderful time.



1994 Oakland Conference Co-Chairs John Leighton and Mary B. White.

Panel Discussions

Glass in Architecture

The Post-Consumer Container

Informal Panel Discussions



Applications for Post-Consumer Glass

Donald McPherson

Post-consumer glass can be utilized in either low-end or high-end applications. Low-end uses such as "glasphalt" or sand replacements in sand casting or cement manufacture are appealing alternatives to communities faced with high disposal costs. High-end use implies some added value. The glass can be remelted but must meet stringent quality specifications and must face the reality of cheap raw materials and high transportation costs. Small glass shops will always use cullet, and implement recycling whenever possible, but this doesn't begin to address the mountains of glass that are generated in metropolitan areas and disposed of in landfills.

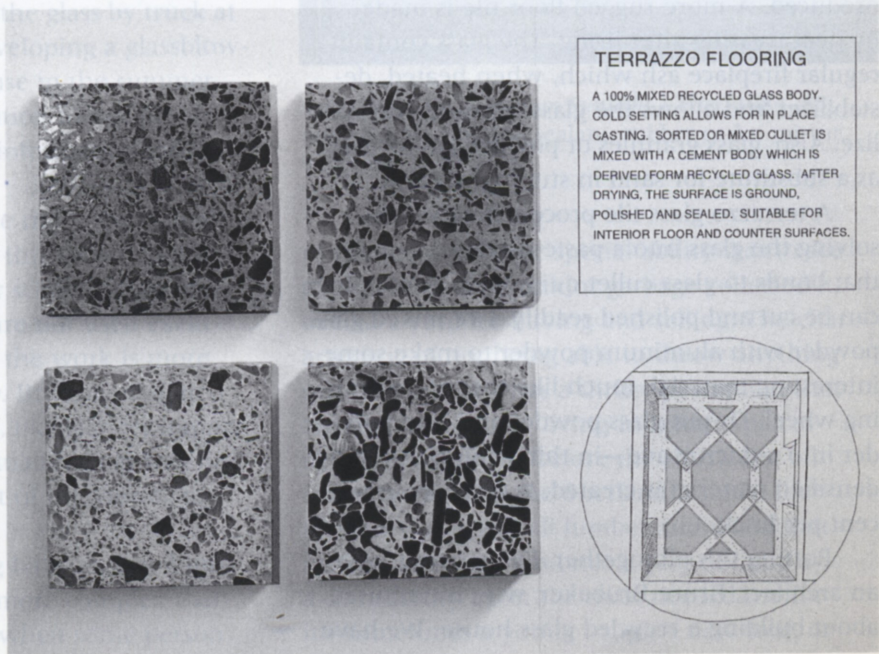
By grinding glass into a fine particle size it is possible to create a raw material that is insen-

sitive to compositional variations and foreign matter. This raw material is generated incidentally during the crushing of waste glass destined for low-end use applications. A wide range of materials can be formed by additions of small amounts of additives. In this manner foamed glasses (both open and closed pore), glass tile, cementitious bodies, and terrazzo tiles can be prepared. By employing well-established forming processes, types of materials spanning building block to roof tile can be manufactured cheaply.

Is it then possible to make a house out of recycled glass? I've been investigating recycled glass materials for seven or eight years now. I've tried to get away from remelting glass because of the energy costs involved, by making

In my work you will see... of the materials come from... other sources of reusable or... materials. Recycled materials... sively as I feel the vision of... important than an ideology... echoes within old materials... in old cafe windows, is a sit... to set up within the rapport... the work.

Donald McPherson, samples of terrazzo flooring made with recycled glass.



building products that minimize the costs of reusing glass as a material. Vast mounds of plate glass and cullet can be found at many recycling facilities. Undersized material (powder, granules, etc.) is particularly difficult to reuse.

I've made a laminated type of glass plate using recycled beer bottles. But I'm interested now in recycling glass in building materials. Drainboard or cement block material with open porosity, a roof tile made of 100% recycled glass stained with mason's stain—these are fabricated in a cold setting process. There's no firing involved. It's a dehydration process.

Foam glass is made by adding limestone to glass. At about 700°C it begins to flow into the form. At 860°C the limestone decomposes into CO₂, which begins to foam and produces a closed-pore glass. This glass can float on water. Cast into large enough forms, it could be used as a kind of monolithic building block.

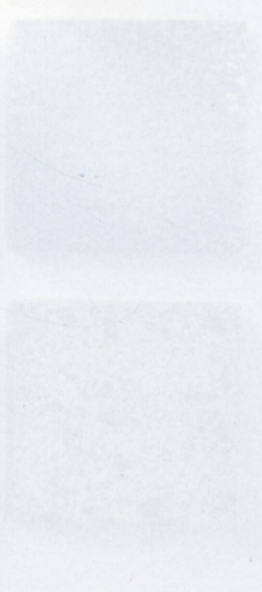
I've tried to mimic existing material such as sandstone block, which can be sawed on a high-speed diamond saw. Other mimicked materials include a "glass masonry unit," in other words, a brick. It has a claylike body made by cold setting, using existing clay brick processing equipment. Tiles can be produced by a variety of firing and cold setting techniques. Marbleizing and very detailed surface finishes can be produced. A more rugged floor tile is made by heat treating after firing. The glass contains regular fireplace ash which, when heated, destabilizes and allows the glass to readily crystallize. Also, glass granules or powder can be used as a substitute for sand in stucco materials.

A terrazzo glass tile process involves dissolving the glass into a paste used as a matrix that bonds to glass cullet quite well. These tiles can be cut and polished readily. I've mixed glass powder with aluminum powder to make some interesting material, much like that of a grinding wheel. Or put glass powder and iron powder into a microwave—in thirty minutes a fully densified material is created. It costs about one cent per brick.

Putting this all together, I've worked with an architect, Bruce Brubaker, who is enthused about building a recycled glass house. We have

a preliminary plan drawn up. The idea is that one could possibly get a regional style based on the recycled glass building material. I'd like to begin with a small demonstration facility. The Bay Area seems like a good place to do this.

Donald McPherson owns and operates Bay Glass Research in Berkeley, California, and has been researching the use of recycled glass since 1987. He received an M.S. degree in Glass Science, and a Ph.D. in Ceramic Engineering from Alfred University in New York.



Donald McPherson
samples of terrazzo
flooring made with
recycled glass

Junk Eyes

The recycling depot on Hornby Island where I live could be an ideal situation for a glass facility to finance itself with sales to the many tourists that visit and support the island's economy. The population goes from 1,200 in winter to 5,000 in summer. Most of the people use the depot during their stay on the island. There is a free store that recycles furniture, appliances, clothes, books, and materials that can be re-used as they are.

As yet in British Columbia glass cullet cannot be used for septic systems, backfill, or road building (probably because of the gravel lobby). Geographically, we on the island are several ferryboat crossings from the nearest glass buyers. Consequently we stockpile hand-broken glass. Employees from the depot break the bottles and separate by color, and when we find a market we then ship the glass by truck at break-even cost or loss. Developing a glassblowing and casting facility for use in the summer months seems an ideal solution to our problem, and we are now gathering information on how to do that.

In my work you will see that a great deal of the materials come from this local depot or other sources of reusable or second-hand materials. Recycled materials are not used exclusively as I feel the vision of the work is more important than an ideology. But the imagined echoes within old materials, like glances trapped in old cafe windows, is a situation that I want to set up within the rapport of the viewer to the work.

The politics of recycling have changed immensely and are infinitely more complex than in the time of our parents, when some person

Jerry Pethick



Jerry Pethick, *Le Semeur, Sunlight + Flies*, 1984–85, wine bottles, silicone sealant, rubber corks, mirror, 96" x 48" x 43".

in the society whose special ability was to see the usefulness of junk or garbage collected it, or had a yard for buying and selling. The characteristic of not being able to throw anything out was cherished as a thrifty perception that farmers and people living in remote places needed to survive. Before the North Sea oil industry came to the Shetland Islands, the residents collected all lumber and wood that washed ashore, then once a year decided as a community upon the most needed use for it—sometimes a young couple's new roof, or

a repair to their wharf. Now we have a much more complex societal pattern combined with the interests of corporate structures that perceive profit in technologically sophisticated reprocessing.

With the growing mountains of waste materials, we need to encourage all solutions, but not at the exclusion of the simpler, small community-based projects. We are familiar with the simple bottle buildings of many visionary artists and local characters, and they showed us one way to pursue bottle recycling. I feel that places that encourage a more efficient use of our resources need to lead the way by example. All structures and facilities should be made from the material that comes to them for recycling. Each recycling depot set up in small communities could have their entire complexes made with bottles. Bottles could be stockpiled instead of broken mindlessly. Clear glass could be saved for glass manufacturing, but other glass bottles (even though deposits for re-use are long overdue for all glass containers) could form underground reservoirs in dry areas or be utilized in house construction.

The technology that reprocesses often loses the basic esthetics of material. Plastic recycling is a prime example with its attempts to make products look like wood planks and fence posts. The glass society has utilized reprocessing with beauty and function and is a great example for other material recyclers to emulate. We must be concerned with energy efficiency and cleanness in processing facilities. A car oil-change utility could supply the stockpiled fuel for a glass facility, but can we get it to burn clean enough to satisfy our ecologically sophisticated society? Yet we can't use unlimited energy either.

If we were able to see the beauty in ordinary things around us we could be using more to make the things we love. I have just had a great failure with mattresses that I thought would operate similarly to a beaver dam to gradually block the annual runoff of water and hold together long enough to gather sticks and leaves to make real dams—not so. Back to the drawing board with this project, but an aspect

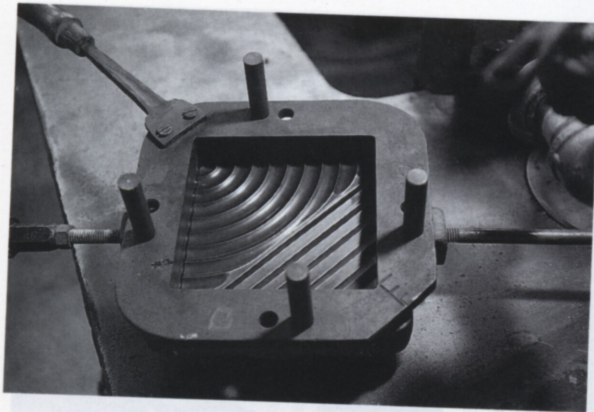
of recycling that has a promising future is the use of integral photography to simulate space.

Correspondingly my own work, while often using materials that have a history, has recently employed integral photography—a system that records many photos of the same scene and then is used to reconstruct a simulation of the landscape space (although at lower resolution than we are usually familiar with). These array images, composites that form into one large full-color image, are akin to daydream space because of their stillness and quality of resolution. But the aspect that does relate specifically to our subject is that it is like recycled space, much the same as stereographic viewers or dimensional films but with the freedom to view at unrestricted positions. These recycled spaces could replace the need to see true wilderness, an indirect method of conserving sensitive ecology or preventing deterioration through tourism or population density.

Jerry Pethick is a sculptor who lives on Hornby Island off the coast of Vancouver Island in British Columbia. He attended various art colleges in England before studying holography and integral photography at the University of Michigan from 1968 to 1970. He was co-founder of the School of Holography in San Francisco during the early 1970s.

Recycling Glass Using Press Molds

Ro Purser



Ro Purser, press mold for glass window tiles.

What always amazes me about this talk about recycling glass is that people—recyclers, governmental agencies, etc.—still don't believe you can remelt glass. But you can melt it all down, labels, caps, and all, for reuse. Recycled glass melts easily, sets up fast, and is very durable.

Molds are the key to efficient recycling. In 1971 I started making molds. I found that recycled glass was very difficult to free blow. All these millions of tons of glass will have to be recycled by using molds. The glass industry has three basic types of iron molds—press molds, blown molds, and dump molds.

For someone making their own molds, the greatest problem is the precision involved in putting them together. In order to use these to full potential, to make 700 to 800 items per mold, these must be precise. They are also expensive—can cost thousands of dollars per mold. Also one needs to know how to design the mold, and what kinds of equipment and processes are used to make it. Then you need tooling—a press, some opening and closing

device for the mold, bigger furnaces, and handling equipment.

In my work using straight recycled window glass, I followed the course of early American industrial glass technology. These are nineteenth-century flask designs. I also remelted beer bottles to make kerosene lamp bases. I enjoy making humble glass items such as these.

I use a glass press, which is the key to using lots of recycled glass. One finds them back in West Virginia from old factories such as the Imperial Glass Company. The first press molds were used to make cabinet pulls back in the 1840s. So I started at the beginning, too, making a press mold for cabinet pulls in my shop using part of an old fishing boat propeller shaft.

I once worked on a fishing fleet, and was later asked by the United States fishing fleet to make glass fishnet floats. I was proud to do this—I was the only maker of such floats for the entire industry. These had to withstand 1,500 pounds psi at 500 fathoms. These are also mold-made.

Mold making requires a lot of tools and tooling—lathes, shapers, etc. I've made thirty or forty different molds in my shop (using lots of old reused machinery) that I currently use to make a variety of ornaments, tiles, and other usable items from recycled glass.

Ro Purser has been recycling glass for various projects since 1970. In 1991–92 he completed an Environmental Protection Agency–funded study on the feasibility of using 100% recycled glass. In addition to his work on recycling, Purser makes art glass and designs molds for production studio glass. He lives on Whidbey Island in Washington.

A Community-Based Process for the Recycled Glass Industry

Judith Silver

In Arcata, California, a community-based program to develop a glass tile manufacturing business continues to progress. The process began when the Arcata Community Recycling Center (A.C.R.C.) wanted to develop local outlets for materials being delivered to the center and thus avoid the high cost of shipping to the Bay Area. Another motivation was the desire to create new jobs through recycling-based manufacturing that would stimulate the local economy.

Funding was secured for a study of five different material types. The Waste Enterprises Development Report was conducted by Gainer & Associates, a community-based recycling consulting firm in Arcata. The study suggested that glass tiles offered the best opportunity for a first venture. Environmental Protection Agency funding was obtained, and a market study and business plan were developed.

Once the particular technology was defined, the questions of business structure and equity needed to be resolved. The community process added an additional component beyond business savvy, technological ability, and artistic sensibility—making the process take longer to engage but ultimately creating a business where everyone's investment and commitment were reflected.

The business was incorporated into Fire & Light Originals, Inc. with five board members, some representing the recycling center and the others from Gainer & Associates. All have full-time jobs in other fields. Another reason the process is slower is that no one person is responsible for pushing the project forward. All decisions must achieve consensus before moving forward, and these decisions must be well

documented so that the process continues to advance and does not slip back into revisiting old issues.

The entire process is also viewed as a model that others can learn from. Gainer & Associates, which consults with community-based non-profit organizations and agencies throughout California, suggests that community organizations may want to create a strategic alliance or a joint venture with an existing business so that the community organizations can share the burden of business start-up with an experienced partner.

Judith Silver is president of Judith Silver Gainer & Associates, a consulting firm based in Arcata, California.