THE VIRTUES OF MOBILITY

A Thesis

Presented in Partial Fulfillment of the Requirements for
the degree Master of Fine Arts in the
Graduate School of the Ohio State University

by
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* * * * *

The Ohio State University
1990

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“I do not know just how in childhood we arrive at certain images, images of crucial significance to us. They are filaments in a solution around which the sense of the world crystallizes for us... They are meanings that seem predestined for us, ready and waiting at the very entrance of our life.... Such images constitute a program, establish our soul’s fixed fund of capital, which is allotted to us very early in the form of inklings and half-conscious feelings. It seems to me that the rest of our life passes in the interpretation of those insights, in the attempt to master them with all the wisdom we acquire, to draw them through all the range of intellect we have in our possession. These early images mark the boundaries of an artist’s creativity. His creativity is a deduction from assumptions already made. He cannot now discover anything new; he learns only to understand more and more the secret entrusted to him at the beginning, and his art is a constant exegesis, a commentary on that single verse that was assigned him. But art will never unravel that secret completely. The secret remains insoluble. The knot in which the soul was bound is no trick knot, coming apart with a tug at its end. On the contrary, it grows tighter and tighter. We work at it, untying, tracing the path of the string, seeking the end, and out of this manipulating comes art.”

Bruno Schulz,
The Street of Crocodiles
To Channa Bankier:
*Finis origine pendat*
ACKNOWLEDGEMENTS

I wish to thank Richard Harned for his friendship, insight and guidance throughout my course of studies at the Ohio State University. I would also like to acknowledge the other members of my advisory committee, Deborah Horrell and Richard Roth, for their contributions to the development of my work. I want to thank Sarah Rogers-Lafferty, Claudia Gould and Antonella Soldaini of the Wexner Center for Visual Arts for their tolerance and tutelage when I was in their employment. And none of this would have been possible without the unfailing generous support of my parents and my brothers, in whose debt I remain.
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FIELDS OF STUDY

Major Field: Art

Studies with Richard Harned and Richard Roth.
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Background

The present body of work develops concepts, techniques and images first encountered during 1987-88 while studying with Ann Wolff and Channa Bankier in Sweden on a Fulbright-Hays grant. Although the finished pieces in this show at first glance bear little resemblance to the drawings and sculptures of that year, there is evidence pointing to that work as necessary research that exercises a direct influence on my current direction.

I spent the winter of 1988 in the small hamlet of Transjö, deep in the heart of the southern central region of Småland. This heavily forested countryside is the traditional glassblowing district of Sweden, home to Kosta Boda, Orrefors and several other large industrial glasshouses that have been in production since the 18th century. Transjö contains two small studios that produce high-quality hand-blown glass, one of which belongs to the modern master Jan-Erik Ritzman.

As Ann Wolff's studio assistant and student, I was expected to work on her pieces in the morning - grinding and polishing elements, running bowls through the hydrofluoric acid etching baths, cutting stained glass - in return for which I gained the use of the facilities in the afternoon and evening for my own work. Critiques were infrequent and informal; we would meet very occasionally to talk about work in progress or discuss art issues (she introduced me to the
work of Eva Hesse that winter.)

Ann had been trained as an industrial designer, following the European tradition of distinguishing the roles of designer and craftsman, but had left the industry to become one of the first independent glass artists in Europe in the 70s. She limited her activities to directing her assistants and creating images on blanks that were blown by the local craftsmen. Since the glassblowing studios in Transjö were working as production businesses and there was no opportunity for me to blow glass for myself, I followed her model. Jan-Erik offered to blow glass blanks from my designs for a low rate (perhaps in consideration for my status as the village student).

The body of work that I executed that winter was conceived with these conditions in mind and, under the economic circumstances, I began to think of sculptural glass in terms of quickly-produced multiples and blanks that could be individually altered and then combined with other materials at a later time. The basic unit I settled on was an oval rondel made with two underlays that could be etched and sandblasted.

I also began to learn how to weld steel rod and plate with an arc welder under Ann’s husband’s direction. Although I had worked at integrating glass with wood, bronze and cast aluminum previously, I had never combined it with steel. The two materials seemed to have shared qualities of coolness, hardness and suppleness that made a sensible combination. I worked directly from sketches, using the contrast between the
standard shape of the rondel and the sinuous line of 4 cm steel rod.

From my previous attempts at joining dissimilar materials I was also sensitive to passages of transition between media and establishing a dialogue between different materials. Frustrated with attempting organic transitions from one to another, I began to literally stick one to the other, piercing the rondel’s center with the rod or at multiple points along the perimeter (Plates I and II).

Although I was dissatisfied with that winter’s work, abandoning most of it in the woods surrounding Ann’s farm, I now recognize it as pivotal in its use of repeated modules of glass coupled with linear steel armatures.

The other half of my Fulbright year I was in residence on the island of Gotland, studying with the Swedish painter and printmaker Channa Bankier. Channa perceived my need to find my own idiomatic expression in drawing, which was hampered at the time by too many undigested influences and stylistic sources and typical of the novice. “Bad artists borrow, good artists steal,” as the saying goes, and I had not yet made any of these influences my own.

Channa’s strategy was to impose severe limitations of subject matter and guide me, through discussion and reading, on an interior search for my truest expression of a single image: my self-portrait.

During the months that I worked on Gotland, I averaged a self-portrait every other day. I would try different drawing media – pen and ink, brush and ink, copperplate
Plate I. "Velvet Tears" (1988)
Plate II. "Persuit" (1988)
etching, charcoal, pastels, pencil, graphite with wash — as my frustration grew and my sources revealed themselves in mimicry of style. It was a purgation of everything that I had learned in years of drawing, rapidly fleeing through varying degrees of realism and expressionism, dodging from one tradition to another, as if pursued by the cleverness of my own hand.

Channa’s advice — invariably cryptic, such as “When you shut one door, another one opens” or “If you lock the doors, they’ll come in through the windows” — was helping as much as a koan helps the Zen acolyte, but she kept hinting that the images that I would recognize as my own would take me by surprise. I had to start with as few preconceived ideas about this image — my own face — as possible, and discover the content of the drawing through the creation of the picture itself. Then and only then would it have the requisite presence, that indefinable life of its own.

It was a miserable time. I didn’t really know what I was looking for, but it was apparent that the accomplishments I’d prided myself in didn’t count for much in this new system. Academically correct drawing was, if anything, a hindrance, a handicap to be overcome. Channa’s dictums sounded like the worst of the crypto-mystic, gaseous plateaus of the counterculture and I had no idea what she was really talking about.

I think the breakthrough came at a point of sheer exhaustion, having steadily regurgitated the history of Western art for six months. I couldn’t bear to look at my own
face any more. "No good, try again!" Channa would shout cheerfully, always adding that she was sure something else was hiding underneath the superficial and correct drawings.

At some point, I began to be surprised myself at what would come of a drawing. There were no references to the portal sculpture of Gislobertus, no narrative environments of moonlit fields, no dynamic balance of composition within a shallow pictorial space, or any other intelligent tactics. It would be a picture of a face that bore slight physical resemblance to my own, staring balefully back at the viewer with undisguised contempt or lost in the mild despair of unfruitful introspection (Plates III and IV). They were unwholesome, but undeniably my own and they were the rewards of half a year's bewilderment.

More than discovering a process of drawing, I began to realize that this source of personal imagery and the essence of my art was a manifestation of self-knowledge, revealed to the artist and the viewer by nonverbal, intuitive means.

My goal upon entering graduate school at OSU was to synthesize the two experiences of Småland and Gotland to create a body of work, using glass as a sculptural medium, that used this working process.

I worked on the idea of using an interlocking cylindrical glass module in sketches from the winter of 1988-89, drawing fanciful machines and figures. At the time, the technical difficulties related to blowing identical multiples presented a challenge that I did not take up until a year later. My work on the present series began in the winter of
Plate III. "Self-Portrait" (1988)
Plate IV. "Self-Portrait" (1988)
Content

The title of my thesis offers a conundrum, seeming to suggest that the ethically neutral notion of mobility has some inherent moral superiority (over, perhaps, immobility). There is no indication that can be supported by internal evidence that the "virtuous mobility" has anything to do with sociopolitical mobility, the progress of an individual from one social group to another. This pairing of concepts which does not readily yield meaning forces viewers to re-examine the individual meanings in light of their juxtaposition and create a new meaning for themselves.

Virtue is commonly understood to mean moral excellence or goodness, but in this work it has its secondary meaning of an admirable quality that has nothing to do with principles. An example of this meaning might be, "He may be a perfect idiot, but at least he has the virtue of knowing it." Another secondary meaning refers to a kind of power or force, as in the Wizard of Oz's appointment of the Scarecrow as his successor "by virtue of his superior brain." And finally, "virtues" refers to an order of angels in medieval angelology (somewhere below seraphim and cherubim and above powers, principalities and archangels) and by extension, some kind of totemic figures.

Mobility, the quality of being mobile, has a variety of potential meanings as well. There is physical mobility, which is the capability of moving readily, and this is certainly
present here, but there is also the meaning of mobility as change. A quick response to impulse indicates emotional or mental mobility. And mobile has, of course, its own meaning in the jargon of art as sculpture that is balanced in suspension so as to allow independent, free movement.

The ideal of mobility has always been an essential component of the American culture. Its tradition in our literature extends from Whitman to Kerouac, and has been celebrated in the popular culture, especially in the twentieth century, by the hero-traveller (such as Lindbergh and John Glenn).

All of these meanings can find some place in this body of work, which was conceived as a personal statement on the desirability of the freedom of movement, expressed in the images and forms of locomotion, and the dynamic relationship between mobility and stability.

If (as Bruno Schulz theorizes) the source of all art is an attempt to unravel personal childhood mysteries, then what is the origin of this body of work? These objects were inspired less by images lifted directly from a childhood spent playing with Legos and Tinkertoys, and filled with endless automobile trips, than by the awareness of mobility and transience that permeated those years.

My peripatetic life has been such that my family set up household in eight different cities before I left home at fifteen. I attended five grade schools, two high schools and since leaving college (I have by now attended six universities) have lived in seven of the United States and on
two other continents.

The simple and important distinguishing question of identity – "Where are you from?" – leaves me speechless. As a child forced to cope with the particular problems of being the class novelty (conferring instant "outsider" status), certain traits of social agility were fostered and "virtue", in one sense, consisted of recognizing inherent political structures, adapting to local customs, and thus finding my own powers of mobility.

The physical mobility of these years has become habit by now and the notion of permanence has become associated with inertia and stasis. But mobility is chiefly seen as a characteristic of young adulthood; seeking one’s fortune before "settling down." The image in our culture of perpetual mobility is the hobo or the drifter, with all their negative connotations. This is mitigated by the general restlessness and rootlessness of contemporary American society, but clearly, there is a threshold of tolerance for the duration of unfettered movement which must be respected, and cannot be crossed with impunity. Mobility, in terms of vocation or personal relationships, is equated with immaturity.

In the works seen in this exhibition, there is often a formal tension between the stability of the upright or rigid glass columns and the indication of movement in the steel structures. In "Plum Pulling" (Plate V) the sweep of the linear steel caught in mid-turn seems at odds with the motionless cobalt columns. By virtue of the mechanical devices and recognizable imagery of transportation, a
Plate V. "Plum Pulling"
potential for locomotion is implied, yet there is never any feeling of arrested motion. These objects exist at a point where movement is considered and the trembling moment of decision is apparent. The freedom of movement is maintained as a choice, but is never given greater weight than the existential satisfaction of being and remaining rooted at a single point in space.

There are also narrative conflicts, where the glass is "threatened" by the steel. A wheel may be poised to smash a column, a tendril hovers menacingly above a stack, or the glass is perched precariously on a machine that is about to be set in motion. In "Wandering Ladder" (Plate VI), the ladder, as an image of ascension, supports the glass column which is, in turn, being grasped by the two-wheeled vehicle that moves laterally.

Formally, this paradoxical coexistence of motion and stability is underscored by the visual mass of the stacked glass that is set against the tentative linear structure of the steel. The steel, known to be dense and durable, becomes the line that only sketches in a form whereas the glass, weightless in its transparency and fragile in its vulnerability to fracture, is seen as the bulk and spatial substance of the sculpture. This is most effective in "Hyperion" (Plate VII), where the three adjacent columns of clear glass for a transparent wall that defines space but is diminished.

The use of color has been kept deliberately simple in this body of work, with most of the pieces using one color in
Plate VI. "Wandering Ladder"
Plate VII. "Hyperion"
the glass set against another in the steel. The hues are adjacent to each other on the color wheel, downplaying the intense saturation of color in transmitted light through glass and any vibrant contrasts. The bright enamel colors painted on the steel also call to mind toys or playground equipment, consonant with the Lego-like appearance of the glass. "Big Orange Trike" (Plate VIII) sets rose-colored glass, as passengers, in a playful orange tricycle that might have been built with sticks and hoops.

Colors schemes are, in part, determined by association to the images – blue and green for the sea-going "Barge" (Plate IX); white and clear for the temple-like "Hyperion".

Decorative elements were also kept at a minimum in order to focus attention on the formal relationship of the glass to the steel and the simplicity of the color pairings. Flourishes such as the spirals which, on first view, might seem to be gratuitous trimming actually convey information in a stylized manner, such as rising smoke ("Plum Pulling" or "Barge").

The glass elements have three main associations: the figure, the column, and an energizing core of power. Deliberate ambiguity often succeeds in giving the stacks two or more of these associations in a single piece.

As a vertically oriented object that is roughly the same height as the viewer, a figurative association evoking a passenger, a rider, or a driver is often present. The columns are inside the structures, contained as an engineer is contained by a train, and bound to the steel itself with
Plate VIII. "Big Orange Trike"
Plate IX. "Barge"
wires (as pilots are strapped into their seats by their harnesses).

In other pieces, the glass suggests the function of an architectural column ("Hyperion") or a variation on it, such as a smokestack ("Barge"). This allusion is strengthened by the function of the glass in some pieces to give the sculpture actual structural stability and virtual visual rigidity.

Often the stacks suggest that therein lies the liveliness and animating presence of the piece. This is partly due to their central placement in most of the pieces — as an illuminating filament, a fuel rod or a core of vitality — and partly because of the material qualities of transparent glass. It can enliven mass with its slight variations in refractive quality (unique to handblown glass, which contains a variety of imperfections from its manufacture and tooling) and create an optical distortion that changes as the viewer moves around the piece.

There is an obvious connection in the work between the idea of mobility and that of portability. You become more mobile if your grand piano is on casters, for instance, and even more so if it breaks down into component parts. These sculptures might be labeled "some assembly required," since there are elements of the steel that evidently detach (usually held in place by insertion into a sleeve that is locked with a set screw).

The glass module also emphasizes portability with its interlocking feature. The means of its breakdown into
component elements and its reconstruction is easily grasped: after stacking the glass with a rubber gasket to protect the connection, the stack is held into the skeletal steel structure with a quick twist of thin wire – a gesture of impermanence – on each module.

The two primary materials of glass and steel are linked by the third material, black neoprene rubber, which forms the gasket between modules and contributes details (handle grips or tires) to the steel structure. This tends to lend an overall unity to the sculpture and introduces small scale visual elements to punctuate the lengths of steel and masses of glass.

Process

The discovery of the essential image, as I studied with Channa Bankier, happens in a preconscious state and is translated as directly as possible through an immediate medium. These sculptures were first conceived by means of drawings that would occur with as much spontaneity and unedited consciousness as possible. The linear quality of the steel retains this connection to the sketches. From the dozens of quick drawings – often no more than doodles – the critical process of choice intervened to recognize and select the most promising.

Then small models were built, on a scale ratio of 1" : 7", using easily manipulated materials such as glass tubing, cardboard, wire and glue. During this process, the limitations of the two-dimensional drawings were countered by
continuing creative decision making in adding a third dimension. The essential image remained, but the indications of spatial existence usually resulted in adapting that image to alter proportional relationships and to rethink the relationship of parts to the whole.

The final creative acts took place when working on the finished piece. Color choices were worked out and the final scale of the object was set. Some problems of balance were resolved. The "line weight" of the steel rod often changed at this point.

In sum, the final execution was built on the sketches and models but required a certain flexibility to respond to the new full-scale image in glass and steel that existed in real space.

Historical Context

There are several examples in the recent past of artists addressing the theme of movement and mobility by using images of transportation devices. The examples that I cite here are all the work of sculptors, but I might mention at the beginning the drawings of Saul Steinberg. At a certain phase in his career, in the late 50s and early 60s, around the time that The Passport was published, Steinberg drew a number of distinctly odd, unworkable machines that gave every indication of locomotion. His pen-and-ink drawings have always been a source of delight for me, and the linearity of my sculpture may reflect this.
There is no denying the indirect influence of David Smith in this work, either. Although Smith only dealt with vehicles in a handful of his pieces (Plate X), his process of shaping sculptures directly with welded steel rod and plate gave the field a new language of construction.

Similarly, the elegance of Alexander Calder’s mobiles will be an association recalled by anyone working with steel rod (Plate XI). Calder’s adaptation of line to sculpture and his bold use of strong colors may share some affinity, but the gracefulness and easy sweep of line that is so important in his work is missing here. When he did turn his attention to vehicles, as he did with some of the wire constructions for his Circus in the 20s, and at odd moments later on, his main focus was always on the cargo—some living thing, usually an animal.

Jean Tinguely (Plate XII) might also be summoned to this discussion as a sculptor whose overwhelming concern was movement. The mechanical movement of his clanking collages was an embodiment of the idea of change, which he saw as central to all creation. Curiously, he only made a handful of distinctly vehicular sculptures, although many contain visual references to trains and cars.

More recently, there is the example of Chris Burden. His E-car projects (Plate XIII) were designed to demystify the everyday technology of automobile machinery and celebrate the beauty of ingenious, efficient design.

In a similar vein the contemporary Dutch artist Panamarenko translates his obsession with flight into objects
Plate I. David Smith, "Sentinel III"
Plate XI. Alexander Calder, "Bird on Wheels"
Plate XII. Jean Tinguely, "Lotus"
Plate XIII. Chris Burden, "B-Car"
of poetic fancy (Plate XIV). His planes, zeppelins and kites embody the fantasies of flying and are evidently handmade in an attempt to reclaim the dream from impersonal machinery.

Although three-dimensional glass has a slight history of use as a sculptural medium in the present era — Marcel Duchamp's "Large Glass" and the work of Christopher Wilmarth come immediately to mind — it has more often been qualified as a craft material. Its long association with the functional vessel and the decorative arts was broken in the early 60s with the emergence of studio glass artists.

The studio glass movement, as it became known (although as a movement it lacked any unifying aesthetic platform) was made possible by the innovative adaptation of industrial glassblowing technologies — specifically the melt furnace — to small scale studio application. Thus it became feasible for an individual artist to control the means of glass production and glass programs soon proliferated in art departments at the university level.

However, in the work produced in the first twenty-five years, there are two constants that exist as limitations to fully sculptural expressions using blown glass forms.

The first is the problem of scale, with nearly all of the objects limited to two feet or less in any one dimension — pedestal-sized, but hardly comparable to the scale of work being done in more traditional media. This is largely because of technical considerations and physical limitations: annealing times increase geometrically with the mass of glass, extending to periods of weeks when reaching the
Plate XIV. Panamarenko, "Umbilly II"
thickness of one foot. Furthermore, the muscular leverage required to manipulate a larger piece of glass on the end of a blowpipe strains the hardiest physique.

The second limitation is a perceived fetish for the exclusive purity of handling glass as a medium. There seems to be a high value placed on making something entirely of glass, which is seen in the ridiculous lengths that artists have gone through to stretch the application of glass. Intrinsic qualities of the material are ignored or violated to no real end in order to achieve an absurd conformity, much as one might gloat over building a full-scale replica of the Taj Mahal entirely of toothpicks. This material exclusivity is reinforced by the insular world of glass galleries, glass schools, glass collectors, glass magazines, etc.

Both of these challenges can be overcome by a more balanced appreciation of glass as one choice of material which can be used to make sculpture, differing from more traditional materials such as stone, steel or wood only in its unique properties (transparency, fracture, refraction, etc.) and emancipated from its history as a craft medium. This dawning appreciation of the sculptural potential of glass in no way negates its continued use as in traditional crafts, but rather seeks a more penetrating vision of the material rather than the myopic mode now in vogue. Once glass is thus demythologized, it becomes natural to use it in mixed media constructions — overcoming the problems of scale and preciousness at once.
Acceptance of this view within the glass movement contains the seeds of the movement's obsolescence, but that acceptance must precede a broader acceptance by the art world. With the focus shifted from an exclusive concern for material to the content issues of contemporary art, glass as a sculptural medium—selected as the appropriate material for particular expressions—will enter its majority.

Art of the 90s

Modernism, the dominant art of the dominant culture of the 20th century, has always placed a premium on novelty. This is a view which has been buttressed by the 19th century invention of art history, which views its development as a linear event. Formal invention draws upon previous work to carry forward new arguments; conceptual plateaus are gained by building on accepted canon.

Arthur Danto, citing Hegel's theory of history, claims that in the early 60s, art history concluded its linear development with the Brillo boxes of Andy Warhol. Challenged in the last century by the invention of the camera to redefine itself, art concluded its linear development with a spectacular burst of self-consciousness and came into full self-awareness when it crossed the boundaries of philosophy in the mid-60s. By answering the question of the nature and essence of art through its own activity, art has solved the riddle of its existence.

To use his analogy, it was as if the existing planet had been mapped and there were no new continents to be
discovered. The world was known. Thus we had come to the end of art history – henceforth there would be no more vanguard movements, no avant garde, because there were simply no new worlds left to conquer.

(Anticipating some confusion from an art market that has been built on successive novelty, he sees the current era as a period of false history. Artists of the 80s only seemed to be breaking new ground when, in fact, their activity was atavistic.)

But the end of the history of art was not seen as the end of art; art may have come to a philosophical end, but it did not stop. If there were no new continents to discover, there was plenty of territory on the old ones left to explore and make habitable. Artists had gained the freedom to roam at will without the burden of furthering the development of art’s self-defining task.

Activity in the art world of the last decade would seem to bear out Danto’s conclusions. Rather than making bold assertions, on the order of the Cubists’ or Dadaists’ early experiments, Postmodernism is a final assessment of modernist traditions. Sifting through the moments of inspiration that furthered development of ideas and broke from traditions, it reassembles and critiques from a position of amalgamation. Its dominant mode is not visionary but ironic and its strategies are appropriation and juxtaposition rather than literal innovation. While the best of Postmodernism seeks to bring us to a sharper awareness of our times – especially an awareness of the manipulative role of an inherently biased
mass media — its strategies are reactionary rather than revolutionary.

With what is essentially a backwards glance, even a return to classicism in some cases, for its prevailing vision, Postmodernism is typical of the fin de siecle paradigm set in the last decade of the last century, in a climate of sophistication, world-weariness, and fashionable despair.

This was the time of the weary aesthetes, of treacly Bouguereau and the Beaux-Arts. The grandeur of the Gay Nineties has been replaced by the cynical reappraisals of Postmodernism, but both have in common a reflexive evocation of the recent past.

The controversy provoked by Jesse Helms can be understood in this context as a defense against the changing of the guard, as it were, that would finally eliminate the last ideological barriers to complete freedom of content for artists. In this way, it shares the modernist stance of exclusive definitions of what art is or isn’t, differing only in criteria. The restrictive qualifications of censorship contained in the proposed amendment seek to protect and enforce earlier modes of expression, to buttress the status quo of the dying century and check an expanded liberty of thought and expression in the time to come. It belongs to the old paradigm of seeing some art as more “correct” than other art. In historical perspective, it may come to be seen as less of a puritanical anomaly and more as an accurate indication of the general thinking of the time.
But concurrent with the decadent fin de siecle posture in the 19th century were the first strains of modernism and I believe that the art of the 1990s will anticipate the next century also. It is not Postmodernism— which is the coda, the epilogue to modernism rather than a real departure— but the activity that Danto imagined: the intensive and personal, human and idiomatic exploration of the known world.

The essential evolution will be the change in thinking of art activity in terms of successive movements that define a particular aesthetic platform. Art will continue to be an expression of the consciousness of the time, but it will no longer be judged primarily on the novelty of form or content as it redefines art. Rather, the criteria will be intensity of personal expression and a broader appreciation of the human value of art.

As I see it, artists will be free to work in traditions that draw from classical, romantic or modernist movements, as well as non-Western cultural sources. Work will be abstract or figurative, in any media, following any agenda. With the end of an art history that dwelt solely in the European and American sphere, any other norms become valid parameters: multiculturalism will gain momentum. Attacks on the Eurocentric, sexist and elitist art establishment have already begun.

The new paradigm means freedom for artists from any dominant program and a new responsibility for honest personal choices and an uncynical and even playful vision. Without prevailing dogma— even the dogma of Pluralism— the
expression of the times will rely on an artist's truest sources of imagery; culled from Western heritage, an expanded appreciation for previously marginal art and the introspective search for expression.

It will be the triumph of idiosyncrasy, the virtuous freedom of artistic mobility.
APPENDIX A

Itinerary

1956 Born, Osaka, Japan.
1958 Moves to Whittier, California.
1959 Moves to Torrence, California.
1960 Moves to Beavercreek, Ohio.

Attends first grade, Beavercreek public schools.
Attends second grade, Mardi School, Dayton, Ohio.
Vacations in Florida, Michigan, and Virginia throughout childhood.

1964 Moves to Bedford, Massachusetts
1966 Moves back to Beavercreek, Ohio.
1967 Moves to Oakwood, Ohio.
1968 Moves to Arlington, Virginia.

Attends junior high school, Arlington public schools.
Travels to Philmont, New Mexico.
Summer school in Andover, Massachusetts
Summer school in West Point, New York

Attends 11th and 12th grade, Phillips Academy, Andover, Massachusetts.

1974 Attends college in Williamsburg, Virginia.
Summer job in Palatka, Florida.
Summer job in Kennebunkport, Maine.
1978 Moves to Austin, Texas.
   Travels to Kobe, Japan.
   Travels to Mexico.
1980 Moves to Kobe, Japan.
   Travels through Kansai, Japan.
1981 Moves to Bethesda, Maryland.
   Summer school in Middlebury, Vermont.
1984 Moves to Baton Rouge, Louisiana.
   Summer job in Gatlinburg, Tennessee.
   Summer job in Seattle, Washington.
1987 Moves to Sweden.
   Lives in Transjö and on the island of Gotland.
   Travels to France, East and West Germany, and
   Czechoslovakia.
1988 Moves to Columbus, Ohio.
   Summer job in Deer Isle, Maine.
1990 Moves to New Orleans, Louisiana.
APPENDIX B

Mold Construction

The mold construction for the glass units used in these pieces consists of two lengths of heavy-walled steel pipe welded vertically together with a slight overlap and fixed 1/16" above a base of 1/4" steel (to allow for venting).

The lower portion has an inside diameter of three inches and the upper part’s original inside diameter is a half inch greater (thus allowing for a wall thickness in the glass piece of 1/4”). The interior of the steel tubing was machined smooth to create a fractional expansion of the interior dimension which would provide a vent and to eliminate the seam. Care was taken to align the two sections in precise vertical orientation to one another by fixturing both sections in a lathe before welding (Figure 1).

Before this design was finalized, several variations on molds were tried. Plaster molds were rejected, as the wet plaster produced too much steam and resultant chill marks, and the limited durability could not insure the hundreds of exactly identical impressions required. Wooden molds were more durable but eventually detail would be lost and dimensions would change as the mold was burned in. The problem of “blowback” from steam and pebbly texture still existed.

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Figure 1. Section view of pipe mold.
In order to provide a smooth rotation in the blowing process and avoid scratches, a commercial separator (Renite MPR) was used. Different release agents were tried, including graphite powder in a suspension of water, fine sawdust, cork powder and flour. The advantage of Renite MPR is the superiority of graphite as a non-flammable lubricant and its organic binder, which bakes on a coating that holds up for half of a dozen impressions before recoating is necessary. The binder burns without any ash or residue and the fumes are non-toxic. To apply this compound, the mold and the lubricant are heated to 150 degrees Fahrenheit before "pasting" the mold with a pad of fine steel wool. The coated is then baked on at 800 degrees Fahrenheit for ten minutes.

In order to avoid either chill marks or glass sticking to the mold, it is heated to 500 degrees Fahrenheit before being blown into. At first a stationary torch was used for this purpose, but it was difficult to maintain a uniform heat throughout the mold and the energy costs were relatively high.

A small kiln was then constructed to provide a more even, steady and cheaper heat. The unit was constructed of high-temperature soft brick as a floorless wall that surrounds the metal mold, leaving approximately an inch of heated air space around the metal for convection. The elements were wound of 45 feet of 18 gauge Kanthal wire and inserted into channels carved from the brick in three tiers. The kiln is run on 110v current, reaching a working temperature in thirty minutes (Figure 2).
Figure 2. Section view of heating chamber showing placement of elements and pipe mold
Mold-blowing

There are several special considerations of technique that apply only to mold-blowing and, in fact, run contrary to traditional glassblowing practices. Furthermore, the unique configuration of this particular mold requires a parison of very specific dimensions and mold-blowing techniques must be adapted to this end.

In conventional glassblowing practice, an object is shaped sequentially off the end of the blowpipe, starting from the neck and working down to the foot. The gather is worked slowly to achieve an even wall thickness as the specific shape is gradually given to the piece. The working temperature varies throughout the course of the manufacture, with specific areas being directed to the heat as they are being worked on.

In contrast, mold-blowing technique involves forming a bubble with a uniform wall thickness that is as close to the shape of the mold interior as possible. The entire bubble is then raised to a very high heat, inserted into the mold, and blown all at once into its final shape. It may then be transferred to a pontil and opened, worked with bits, decorated, etc.

The technique for forming the glass modules used in these sculptures varies somewhat from the process described above. For example, since none of the units were to be transferred to a pontil, there did not have to be a corresponding mass on the bottom of the objects. The entire
bubble could be blown with less glass and the walls could be uniformly thin.

In addition, the wall thickness had to be shaped in a manner that allowed the interior diameter of the top of the finished units to receive the corresponding bottom exterior dimension. This meant that the wall thickness very near the neck of the bubble had to be less than the difference between the interior dimension of the upper mold wall and the interior dimension of the lower mold wall; approximately 3/16".

This became problematic when trying to heat the entire parison to a high temperature, since a thinly blown neck would become a "hinge point". It was necessary to allow a relatively thick neck in the bubble that rapidly gave way to the thin wall of the upper bubble in order to assure a proper fit between units. This was achieved first, by the placement of the neck further off the pipe and into the bubble as is customary and second, by selectively heating the parison just below the neck and stretching it just prior to entering the mold.

To make the parison, three or four gathers (depending on the viscosity of the glass) are made on a pipe with a two-inch head. The successive gathers are made quickly, so the bubble walls are kept fairly thick.

If color is desired, it should be added as a sheared-on overlay atop small, cold first gather and not picked up onto a collar. When marvering the overlay, care should be taken to leave a substantial amount on the end of the bubble. This
reduces the chance of blowing through the color in the final plunge into the mold and assures a more even distribution throughout the final piece.

The final gather is shaped with a block or paper, the upper half marvered, and the neck of the parison is blown thin. The piece is then heated and the neck line is put in, as described above. In general, a thicker neck is more desirable than a thinner neck since it allows for the entire length of the piece to be heated to a greater degree before becoming too floppy to handle.

After the piece is necked, the entire parison is heated and swung, which thins out the walls directly below the neck (which will become the opening of the finished unit). The parison is then marvered on the end and blown, being careful to leave a thin but even bottom. It is once more heated and swung out, until the bubble is approximately the height of the mold (nine inches) and the diameter is somewhat less than the interior dimension of the mold.

It is then given a final heat in the glory hole until the walls of the bubble begin to show signs of collapse. As the mold is approached, the piece is hung down — which will re-inflate the bubble and add a couple of inches to its length — and inserted into the mold. It is important that the bottom of the piece rests against the bottom of the mold upon insertion to avoid blowing the end out too thin and to give crisp definition to the lower edges. Pressing down slightly and turning the pipe rapidly, the bubble is inflated with a strong and sustained exhalation until it fills the mold and
begins to "billow" slightly over the top.

The piece is then lifted straight out and flashed in the glory hole quickly. The bottom of the unit, which will rest against the annealing oven's floor, is given a touch with the jacks to resist impression. The neck is then chilled and the completed piece is knocked off into the annealer. A steel rack, coated with kiln wash, stores the units vertically to make best use of space.

The entire blowing process takes between ten and twenty minutes, depending on glass viscosity and the addition of color.

Upon annealing and cooling to room temperature, the piece is finished by cutting off the neck and overflow with a diamond saw and upon cleaning the glass form is ready for assembly on the sculpture.
LIST OF REFERENCES


