Entrapment series: A Catalyst for response

Cynthia Jansen Miller

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in Candidacy for the Degree of
MASTER OF FINE ARTS

ENTRAPMENT SERIES: A CATALYST FOR RESPONSE

By

Cynthia Jansen Miller

May 19, 1990
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To Kay
INTRODUCTION

I consider this thesis paper to have two parts, just as I consider the studio effort to have had two purposes. First and foremost in my mind is the emotional content of the work, the true reason I believe it was created. Therefore, I have chosen to present that aspect, and the personal and subjective recollections that relate to it, at the beginning of this treatise. I feel such a position of prominence is appropriate to its importance. Included there will be my artist's statement, discussion involving the relationship of the finished sculpture to my initial intent, my personal reasons for mounting this effort and my hopes for its future.

There will also be a section devoted to my personal experiences with this issue. This work is not to be mistaken as an auto-biographical statement. Truly, it is not. Its message is timeless and universal, like misery itself. However, my life is a human one, affected by the same strife and triumphs as every other person that will be touched by this torment. I include my reflections as a private aside, as thoughts whispered softly so as not to
I have taken liberties with the format in which these various reactions are presented. You will find this section to be less inhibited, more poetic in nature. That is exactly how it should be, a creative flow unhampered by conservative restraint; a word painting born of free strokes and strong colors. It is the creative essence of my art.

The second half will assume the form of a lengthy series of schedules and their explanations. It is here that the technical information and documentation can be found. This thesis really had two lives, the aesthetic and the technical. It was almost like producing two separate theses. The research and experimentation necessary to produce this work was exhaustive, and the difficulties encountered were many. The trials, failures and eventual successes are noted here in detail within the context of the schedules, together with an in-depth discussion of my process and techniques. Everything you ever wanted to know...
PART ONE
CREATIVE ESSENCE

CHAPTER 1
CONTENT AND CONSIDERATION

The Artist’s Statement

Entrapment...cold, oppressive and undefined. It shackles the body and binds the soul. We’ve all felt its chilly agony.

It is something that is more easily forgotten than recalled. It makes us uncomfortable, so we insulate ourselves for protection. But in so doing, we isolate ourselves from the reality of others struggling to break free, those who might benefit from our empathy.

My work represents the essence of our emotional response...the cycle of panic, struggle and depression which repeats itself with lethal frequency. I want to rekindle that feeling in the viewer so they might remember... Sensitivity is a first step toward compassion.
THE WALL: Image and Intent

THE WALL (Fig. 1) is the pivotal work in this thesis. It is a truly three-dimensional sculpture, fully occupying the space in which it is situated and "working" visually from all perspectives. It stands an impressive 7 1/2' high and stretches its dark mass across 8' of floor. It is comprised of 4 wall segments, 8" w x 24" l x 7 1/2' h, oriented with their narrow profiles towards the front/back of the piece, the wider dimension visible from the sides. These segments are positioned in a tiering fashion, each protruding exactly 8" further forward than the last, producing a diagonal construction that when viewed from either side resembles a massive, 4' deep wall.

The walls are built with a new form of cinder block called Stack-King\(^1\) block, pre-cast block that can be stacked upon itself without the use of mortar. I chose the 8" block with a ribbed texture in the dark gray specialty color referred to as "Geneva". The segments were assembled using a total of 20 blocks each in an alternating long/short, short/long block pattern, ribbed texture facing outward.

Three narrow, vertical spaces are created by this

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\(^1\)Haener Stack-King concrete block is manufactured by Rochester Block, a division of TCG materials (New York) Incorporated, Fishers, NY
formation, one between each segment. The spaces measure 20" and are filled with wooden frameworks which are in turn bolted into the cinder block walls. These frameworks consist of open sided, 5" deep spaces divided into three compartments. The three slumped glass body segments for each of the figures are fitted from behind into these frames, creating the illusion of continuous figures contained in the narrow enclosure. Wooden casements provide the external finish, painted dark gray and distressed to resemble peeling, weathered window frames.

Facing panels of 1/4" smoked plate glass are fitted 4" in front of the slumped figures to define the parameters of the volume of space that is trapping them. This volume is suggestive of the original dimensions of the cast block format that was forsaken.

These front panels serve another, subconscious purpose. The subtle gray coloration provided by the smoked plate glass creates an almost subliminal mood stimulus to help move the viewer toward a sense of foreboding or oppression. This color was plied with the choice of charcoal gray cinder block and paint on the wooden casements to create a visual environment that would promote the appropriate emotional interaction. It was tied to the other castings in the show by use of the same dark gray paint on the display pedestals,
effectively making them extensions of the actual works. In this way, I was able to use color as a tool to elicit emotional response without making a blatant reference to the color itself.

The figures themselves represent three possible reactions to the cycle of entrapment, panic, struggle, and depression. They are formed in brilliantly clear Bullseye glass sheets, slumped to achieve the sculptural relief. Their bodies are lightly sand-blasted to help distinguish them from the space that imprisons them. Their frosted skin glows with a soft, satin sheen, like moonlight through vapors or ghosts in the night. The spacial glass flashes with light refracted by its creases and scars, distorting the background reality and allowing it to dissolve into the misty illusion.

The PANIC figure (Fig. 4 and 5) is female. She screams in pain and horror, overcome by the nameless trap that threatens to encase her. Her left arm encircles her forehead, as if to effect a desperate attempt at self-protection; her right fist is clenched in frustration. The deep lines around her gaping mouth express the strain of her agony; her eyes are squeezed shut beneath a tortured brow. She draws herself in as if to shrink back from her oppressor, frozen by fear and defenseless.
STRUGGLE (Fig. 6 and 7) is also a female form, but far different than her co-inmate. She has mounted a fight, blinded by rage, straining with every muscle to stretch upward out of her prison. The corners of her mouth are drawn back in a grimace, barred teeth clenched in irrational determination. Her eyes are electric, wild and charged with fury. The chords in her neck stand out like slender ropes, taut with the tension of readying for battle, but the release never comes. The enemy is unseen, unknown. The oppression is insurmountable. The energy is summoned and spent without success, for the effort is unfocused. There is no plan, no rationale; the result is pre-determined. The struggle becomes but the second stage in the hopeless cycle of response. It is no more than a fitful frenzy, like a hooked fish that jerks in violent exertion to break free, a desperate attempt without direction.

The third figure is DEPRESSION (Fig. 8 and 9), crouched low in his narrow confinement, huddling in his despair. He is folded in upon himself, cradling his heavy head in weary hands, silent and withdrawn. His eyes droop in a sightless stare, for he is lost in his hopelessness.

Together, these figures represent the entire spectrum of this emotional response, a cycle that can repeat itself unendingly until its victims are utterly defeated. I
believe it is a state that we have all experienced at some time in our lives, to one extent or another. It is a universal problem.

I have left the nature of the trap undefined, a blank screen upon which we can project our own associations. The label of the trap is unimportant, for it is the impact that creates the problem. I challenge us all to recall our personal encounter with this emotion, to re-submerge ourselves in its power just long enough to remember its chill, its threat. My hope is that our memory will instill in us a greater sense of compassion for those unfortunate enough to remain in its grasp.

Light and shadow, positive and negative, THE WALL stands as a specter of contrasts and conflict within the context of our own living space. I have not provided a release in the cycle, which apparently disturbs some people. The choice was deliberate. If you are disturbed, then I have reached you. For it is not my place to offer a solution. That would be too comfortable, too easily dismissed. In fact, the only solution rests with us, each of us. We comprise the "answer" to the problem, the "release" for the trap. Our willingness to care and to act, even just to listen, could mean the difference between escape and a life-sentence for someone. The decision is ours.
There it stood in the center of the room like an ancient marker, a stoic sentinel in silent vigil. A faint blue light passed through its crystalline mass, the light of spirits and mystery.

This one remained. Of all the effort and time and sweat, it alone made it through the fire. How fitting. The lone survivor representing the lost souls. It had an eerie quality.

This, of course, is IN MEMORY OF... (Fig. 10), the last of the great castings; the only child. It weighs 150 pounds, pounds of ephemeral blue and wispy white. On end, like a mighty stone to mark forgotten graves, it is a massive slab, 24"h x 18"w x 3 1/4" d. The face of PANIC is indelibly pressed into its back, caught in the throws of agony. The image is dim but undeniable, floating amidst the swirling veils like a spirit in the mists of nowhere. It is cold and smooth and rough at the same time. It draws us to it, to feel its presence, to let its chill enshroud our soul; a memorial for the victims lost, a guardian for the memory.

It is a spectre of possible things to come... a warning to our consciousness.
When Does a Scream Remain Silent?...
When there's No One Left to Hear.

(The SILENT SCREAM Castings (Fig. 11, 12, and 13))

Suffering wears many masks and strikes many poses. It tends to be a private thing, hidden from view, avoided. It breeds a sense of loneliness, abandonment and frustration.

For many us, of it consists of stifled sobs in the dark of night, uncried tears in the day. We bear our sadness in a sullen void, bereft of peace or comfort. To share such pain seems unthinkable, unreasonable, forbidden.

And so we go on, from one day to the next, alone in our problems, afraid to reach out. The anger builds, and with it, hopelessness...We hunger for salvation.

There comes a time when it seems impossible, the road too rough, too long. And so it starts, that desperate cry, that unheard plea for mercy. It rises from the depths of us, swelling our lungs with its fury. We open our mouths to release its power and... nothing. The sound is frozen in air, stopped in our throat, trapped in a moment of anguish.

Where do we go when there's no way out, nothing there but emptiness? We become caught in a SILENT SCREAM, with no one who will listen.
The Interview

(The following is included as a reactionary dialogue, a direct verbal response to questions about my work and its purpose.)

WXXI: Today's guest is a graduate of the School of American Craftsman at RIT, Cynthia Jansen Miller, who visited our studios the other day and chatted with Bob Koch, but it's best that she tell you. It's a structure that's being put up at the JCC and she talks about it with Bob Koch. The topic is called "Entrapment".

BOB: Cynthia, you've gotten over the last year, maybe before that, to be something of an expert on the subject of entrapment. What form has this taken for you?

CINDY: Well, my thesis is involving entrapment as an issue. I've tried to create works that deal with the emotional response that we all have to the idea of being trapped, and I've created works that tried to create the essence of it which is the

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2Cynthia Jansen Miller, author, Interview by Robert Koch, Simon Pontin's Super Scintillating Sunshine Show, 91.5 FM WXXI, 8 May 1990, Rochester, tape recording, Rochester, NY.
panic, struggle and depression cycle
that we get trapped in and keeps repeating
itself and it seems endless at times.

BOB: Were not talking about rap here, were talking
about a certain visual art, aren't we ....

CINDY: That's right, were talking about a thesis that is
based in glass. My Masters of Fine Art is as a
glass artist at RIT and the images I've created
are primarily in slumped glass, which is a kiln-
worked process, starts cold, goes hot, they call it "warm glass" in the genre.

BOB: Slumped somehow seems to fit entrapment....

CINDY: Yes, very much so,... and it's also incorporating
mixed media, such as a cinder block wall (in the
case of the main piece) which represents the whole
cycle of entrapment. It combines cinder block,
wood, slumped glass, and three life-sized glass
figures that are trapped in this wall.

BOB: How did you come to this idea, this need to
envision entrapment?
CINDY: Well, of course, I believe the premises that we all go through being trapped in our lives, the same as we share common emotions in all areas. I'm not alone in that, I have my own traps, as we all do, and I bring those to the work. But this is not about those traps. I felt called to do this thesis, a spiritual kind of calling, and there's a need to be filled here. What I'm trying to do is create a work that the average viewer will look at, whether they have any art background or not makes no difference. They will look at this work and hopefully will feel this emotion. It will trigger something in their memory, their own associations. They will remember when they felt trapped. It's not a very pleasant emotion; it's something you tend to try to forget. But when we do that, we tend to distance ourselves, and then isolate ourselves from other people that are currently trapped. So what I'm trying to do is to get you to remember what it feels like, and hopefully, a little bit of that will go away with you and make you more sensitive in a situation where you run into someone who is trapped. Perhaps there is something you can do. There is no easy out. I have not provided that pat answer in the series; there is no release. That bothers
some people. But I think the reason is that we are all the release. It’s up to all of us to do something, not just for ourselves, but for other people.

BOB: You come to your glass work and visual arts out of a music background. Has that made a difference in how you approached the visual media?

CINDY: I think it’s made a difference in the sense that I have a need to tie in different kinds of media. I have a hard time sticking to any one specific medium, even in my thesis work, even though I’m a glass artist. I had originally considered the idea of a multi-media presentation including sound, and I think in future works I may well do that. I’m envisioning these kinds of things being a permanent installation somewhere, (perhaps in a public forum, perhaps a corporate atrium setting that has access to the public). I see no reason that appropriate sounds couldn’t accompany this in a subtle, almost subliminal way to help encourage the mood, to help create an environment, so that’s very possible.
CHAPTER 2
PERSONAL COBWEBS...

My Requiem for the Trees

I remember that day, the day they cut the trees down. And beautiful trees they were, too, standing tall and proud like sentinels beside the river’s edge.

I remember lying under those trees, loving and laughing, running through golden mountains of their dry, crunchy leaves.

And I remember the machines...loud, heavy monsters grinding their teeth and waiting to be fed; and the men that rode them...neutral tan men whose faces expressed no understanding of their horrific destiny.

I remember running at them, yelling, screaming, What were they doing?! They had no right...no one had the right...! But the neutral men with blind eyes were deaf, too.

I remember my anger, the tears of frustration, and then
the helplessness, the hopelessness. When man verses nature he usually wins, but always loses.

There’s an expressway there now where the trees once grew, the green peace severed by blades of gray. Cars fly by, across the river, right over the tops of the tress that were the old trees’ neighbors. But not one of them sees, not one of them knows enough to even pause and pay their respect.

I still go back, sometimes, when I feel strong enough to ignore the noise and bear the pain. I sometimes think ‘This will be the last time’ for it’s so depressing. But again, I return...in respect...to remember.
Blind Fools

I remember well the temple hall in the city, resting in stoic silence amid the gritty bustle that surrounded it. It was a great hall, large and cavernous, its sculptured ceilings rising high into the dim void above my head. Sometimes, when the meetings were over and the crowds had gone, I would stand alone in the half-light of ornate chandeliers, drinking in its greatness.

It was cool there, even in summer, when popsicles dripped from sticky, black fingers of the neighborhood children who sprawled across the broad steps of the grande front entrance...cool and quiet. I would often run my hand down the smooth stone railing of the Chapter Room and feel the heat flow out of me into its massive structure. My fingers would play over the intricate carvings, the images engraving themselves in my memory like braille. The ornament was bold and ancient and everywhere. It spoke of symbols and substance and ritual. It stood for principle and reverence for things that last, the credo of another time.

I remember, too, the loss I felt when we left this fine hall for the suburbs. Money, they said...the rent was too much, the heat bills too high, and the streets were unsafe
in the evening. They fled instead to a cinder block box with plywood floors and flat molding windows. Nylon rope hung where the railings had been, and the stone was replaced with cheap pine. Fluorescent lights glared where the chandeliers had sparkled, and the symbols were printed on banners like shoddy advertisements. The grande front stair was a concrete slab; the popsicle stains had vanished. What was cool was now cold, the massive...mediocre, bare and lifeless, its character lost.

They had run from the city to the 'safety' of suburbia, groping hungrily for its bland pabulum to comfort their fears. The trade-off seemed complete...presence for plastic, power for 'protection', rescued by the modern era, cocooned in neutral gray.
Memories in Bittersweet

It was late at night, about 3 A.M., and still there hummed the low drone of the sander's motor. It carried from the basement up through the floor, on and on like a tired heartbeat, pumping through the night.

It was his way, late nights and long hours, till at last a thing was done, finished. Frames mostly, big, round, heavy frames, frames of sturdy oak and black walnut. The smell of fresh sawdust would hang sweetly in the dusty air. The stuff would coat his glasses and frost his hair like gentle, fluffy snow. But his hands kept working, shaping and smoothing with every stroke, caressing the wood as it yielded to his touch, the slow dance of the craftsman and his chosen partner.

He always amazed me with his patience and stamina, planning for weeks to perfect his designs. His approach was precise and methodical, like the numbers that played in his brain when he wasn't working the wood. The ideas were clear and uncluttered; 'pretty' he called them in a mathematician's jargon... 'pretty' and functional and 'true'. They were meant to last a long, long time, protecting the images they embraced.
How often the craftsman must fade before his wares, yet his maker's mark lives on. The saws are silent now, the sawdust settled. But the frames remain to see and touch. Their silken forms still glow from hand rubbed oil, their massive strength still guards the fragile glass.

They were made with care and purpose. They will last with care and love...these simple frames, this lovely wood...a testament to the craftsman.
A Song for Michael

When he smiled, the corners of his eyes would crinkle in silent laughter like sunlight skipping along the surface of a secret pond. His gaze was gentle and steady, drawing you deeply into blue-gray pools of spirituality. Thin blond hair, long and tangled, formed a wild fringe around his bearded face, a reference to the grog of stubbornness which textured the smooth clay of his moral core.

He would sit for hours, his body still, his mind racing, probing and exploring the shadowy dimensions of numeric theories, dreaming a mathematician’s dream of what might be.

His patience and sensitivity extended like a lifeline to those in need of support. He was sometimes misunderstood, but always understanding. A private man, he was often trusted, but found it hard to trust. Yet once committed, his loyalty was fired into his soul, inseparable without fracturing his sensibility.

He avoided cars and walked or biked whenever possible. The time allowed him a space to think, he would tell me. Simple pleasures were his choice, like gardening, long walks, and Dr. Who. He preferred camping in the chill of
autumn, when the parklands were wet and hushed and the
hiking provided a chance for Nature's peace to settle into
the spirit. He was what I longed to be.

I often thought of him as a personification of the
Universal Truth, as being from a higher place than ours.
His values did not focus on the material treadmill, but were
nurtured by an internalized sense of God and Nature. He had
somehow escaped the traps of this world which I find so
threatening, and merged with the Greater Good which I now
struggle to protect, but find so elusive.

I knew him well for sixteen years. His name was
Michael. He was my friend, my idol...my husband. He is not
now.

The loss is inescapable. His memory pervades my
subconscious and intrudes into my conscious thoughts when I
least expect it. There is great pain in remembering, yet
great importance, too.

The man is gone from my life, but his values, his
spirit remain. He is a part of me. And so I continue to
struggle, to reach for the place he represented, to cry out
about injustice, to protect the innocent, the vulnerable.
Play It Again...

There it is, that song again. I try to ignore it and stare intently (blindly) at the road ahead, yet its melody invades my mind, my memory. My chest tightens and the swallows come hard. I feel it welling up from deep inside me like a great flood of pain threatening to overflow its banks. Finally, the barriers give way and the warm salty rivulets spill along my nose and across my lip. I lick the taste of bittersweet. Michael...

I came here two years ago to begin again. The choice was not an easy one. This had been our town, his town. For nine years we lived here in marriage, and he as a student four years before that. His absence now was inescapable; his imprint, everywhere. He was sealed in the mortar of the buildings, the pavement of the streets. His face appeared to reflect back in every window, and his voice seemed to be carried in the wind.

Even now, the past invades the present when I least expect it, like the song on the radio or the glint of the river as I cross it going home. They are triggers on the gun of mental torture, sensitive triggers fired by my own odd assemblage of associations. I suffer often from self-inflicted wounds.
The ghosts slip silently among the living. Their presence is felt in the soul. The images fade, but their influence remains forever. The past exists inside the present and will be absorbed by tomorrow. For we are today what we have been before, a product of our own experience. We are additive sculptures of personal collage, and the past is the ultimate medium.
I know this wonderful little girl. You're apt to find her this time of year bending low to sniff the first flowers of spring. Or perhaps you'll see her standing quite still to hear the honking overhead, then happily exclaiming, "Geesies!". She loves to splash through puddles and catch snowflakes on her tongue, or lie on her back in the tall, cool grass and watch the clouds float by.

She looks at the world through eyes that see old things as if they were brand new. She questions everything, yet knows everything. She is the center of her own, private universe.

She faces life with a startling intensity. Things matter to her... she cares. She laughs easily and cries often. She likes to be hugged.

I know her well, this little girl, for she is the child inside myself. She is the dreamer, and I'm the interpreter.
She's the designer, I am the builder. Without her I am nothing. She is the source of my creative energy, the eternal spring in my aging cycle. Without her I would be old before my years, dead in thought and spirit. She forms a bridge between my past and future, my connection to myself and the world.

I shall try to protect her always, and never let go of her hand, lest she be lost forever. We must go on together, she and I, forever playing, and feeling, and asking, "Why?". 
Dreamweaver

I watch as the ice melts in gentle drip, drip, drips off the branches of the old ash in the broad front yard. It sinks softly in the deep, wet snow in wavy rings beneath the canopy. Beside the tree the runoff flows like little rivers, carving fresh valleys in the mud along the drive. Snow angels and footprints blur together in a textured tapestry of white on white. These simple signs of spring are magic in my eyes, the raw materials that dreams are made of, the ingredients of fantasy. They have the power to enchant the artist, but the artist must be a dreamer, a dreamer with design.

I close my eyes and breathe deeply, drinking in the taste of crisp air, the smell of wet earth. I listen to the warblers' cacophony and feel the wind against my face. I am the receptor and the processor of dreamstuff. I will record and rearrange all the pattern and the form, all the sound and the experience, all the feeling and the soul that make this place an inspiration. I will extract from this the essence of the dreamer's dream, the special combination of image and idea that pushes dreams into reality.

I will plan for you in color and line, with shape and form and function. I will chart the course and prune the
path of gremlins so the vision will be clear. My experience will become your experience, my thoughts your thoughts.

I must bring to all of this a sense of spirit. I must meet you on common ground. For I am the dreamer and act as your guide. I design with purpose in mind, that we might dream together.
Sensitive Sojourns

Far above in the clear blue sky the sea gulls fly, dipping and soaring on the southern breeze. I let my spirit float with them in lazy circles, drifting slow and free. Waves break gently in the sandy shallows, massaging my body with warm, salty washes. My tensions recede with the ebbing tide and my spirits rise on the wind.

Air and water, ancient symbols, givers of Life and renewal. Now appropriate it is that life and metaphor should merge, as art imitates life and vice versa. Our lives are full of symbolic gesture, the shorthand expression of experience. They fill the void when words cannot, they say what is unsayable.

There are echoes in the symbols as there are voices in the waves and whispers on the wind. They speak to us from some mysterious, common past in phrases of veiled understanding. They bypass the mind and address the soul in a universal spirit language that is felt more than heard. Their message is soft yet meaningful. They draw us together towards some uncertain oneness, a primordial bond from antiquity which stretches to touch the future. They gleam like two-way mirrors, windows in time and reflectors of society. They allow us to observe and be observed, to
understand and be understood. Our symbols will be the icons of our age.

My thoughts are pierced by the shrill sound of a sea gull's cry. They, too, are symbols in themselves, silver kites gliding high above the glistening water. They represent freedom, escape, the call of the wild. I close my eyes and absorb the haunting melancholy of their conversation. They symbolize my feelings well. I feel the need to fly.
CHAPTER 4

IN SUMMARY

Isolation... Communication... Connection

The spoken words ring monumental in hollow, bold type. They stand for esoteric concepts evolving from each other, static in their written state, vital in their practice. They are born of pain and desperation, of the urgent need to transcend the void that surrounds us, to be understood and to understand.

Most of us have known that need, and have met it with our own response. My answer is my work, my art, my effort to capture the essence of emotion and translate it to the visual. The emotions themselves are personal, yet transform and universalize to increase their associative power. The commonality animates the feeling so the viewer must live it, be drawn into it, become a participant in the experience. It tries to pass through the invisible barrier that insulates the observer and separates us from each other, and for that moment, recreate the same feeling within them.

If this can happen, then so can tolerance and
acceptance. A dialogue will have been established between us that can only be heard by the soul. In the end, it is not the specific differences of our lives' experience that matter, nor the many directions our paths may take. The real value exists in the similarities of the lessons we must all endure in a journey which we share. The Truth will be the same for everyone.
PART TWO
PROCESS AND EXPERIMENTATION

CHAPTER 1

TECHNICAL DOCUMENTATION OF PRODUCTION PROCESS TRIALS
MOLD #2 FOR SILENT SCREAM CASTINGS

The following schedules represent working documentation of the trials involving Mold #2, designation for SILENT SCREAM image, generated from Vacu-form #1a (Mold #1 was only the small prototype, and will be dismissed for the purposes of this discussion). They are organized by the following outline:

- Mold mix information
- Variables
- Program
- Results

They are presented in chronological order, and included for the purpose of documentation and comparison.

The original image was sculpted in clay, from which a styrene vacu-form was created and functioned as the reusable master for all trial molds. Therefore, the image acted as a constant, while various operations were performed upon it in an effort toward improvement and variation.

The dimensions of the interior of the mold measured
approximately 12" x 12", while an attempt was made to produce a consistent casting thickness of approximately 3 1/4". All variables and their effects are recorded within each schedule. These trials resulted in the creation of the set of castings entitled *Silent Scream #1*, *Silent Scream #2*, and *Silent Scream #3*. 
SCHEDULE 1

Mold #2, Trial 1

Date: 11/27/89

Mold Mix Formula by % of ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>38%</td>
</tr>
<tr>
<td>Silica Flour</td>
<td>56%</td>
</tr>
<tr>
<td>Alumina</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Variables:

- Plaster mold reinforced with 3" chicken wire, all sides and bottom
- Wall thickness is 3"
- Wet cure (dried only 2 days)
- Wet fired (mold still cold/damp)
- Mold raised on multiple rests of soft brick
- 1/4" air holes drilled in bottom and sides
- Loosely packed, clean Fenton "Teddy Bear" cullet
- Kiln opened at approx. 928 F twice briefly immediately prior to the HTC (High Temperature Cooling) phase

Program:

West kiln #2, mold centered on a 20" kiln shelf, hard-brick tripod support

<table>
<thead>
<tr>
<th>Stage #</th>
<th>Program Mode</th>
<th>Temp. Goal F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ramp</td>
<td>928</td>
<td>5 hrs</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>928</td>
<td>45 min</td>
</tr>
<tr>
<td>2</td>
<td>Ramp</td>
<td>1265</td>
<td>1 hr 15 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1265</td>
<td>30 min</td>
</tr>
<tr>
<td>3</td>
<td>Ramp</td>
<td>1575</td>
<td>1 hr 15 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1575</td>
<td>15 min</td>
</tr>
<tr>
<td>4</td>
<td>Ramp</td>
<td>928</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>928</td>
<td>22 hrs</td>
</tr>
<tr>
<td>5</td>
<td>Ramp</td>
<td>800</td>
<td>15 hrs</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
Program (con’t)

6  Ramp       100  60 hrs
      Dwell        0

Results:

- Generally good results
- Appears well annealed
- Mold appears to have held up well; still firm; only hairline cracks, no splits
- Mold material releases well with little residue
- Glass surface (top) is smooth and glossy with some devitrification swirls
- Side edges and back (bottom) surface of the glass casting have a matt textured quality due to contact with the mold
- Glass clarity is somewhat cloudy with medium sized veiling present; some clear areas
- Good impression from mold; strong detail retention
- Impressed image clearly visible through front surface
- Glass fully melted; partially filled air holes; 1/4" long glass "plugs" resulted and are evident on rear surface
- Slight blueish coloration throughout glass...probably due to the presence of powder blue cobalt used as a decolorant in the original batch for the Fenton cullet; not objectionable...appropriate to the emotional expression of the image
- Final size approximately 12 1/2" x 12 1/2" x 3 1/4"
- Weight is 25.5 pounds
Date: 11/29/89

*Denotes new factor

**Mold Mix Formula by % of ingrediants:**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>38%</td>
</tr>
<tr>
<td>Silica Flour</td>
<td>56%</td>
</tr>
<tr>
<td>Alumina</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

**Variables:**

- Plaster mold reinforced with 3" chicken wire sides poured over a pre-fired (to 800 F) inner core*
  -original core breaking up
  -re-inserted intaglio design in newly plastered floor
  -"sunk" intaglio pieces deeper into floor of mold to minimize stress due to platform format of original mold design; creates the visual impression of the image "breaking up"

- Wall thickness is 3"

- Wet cure (dried only 2 days)

- Wet fired (mold still cold/damp)

- Mold fired flat on the kiln shelf*

- No air holes drilled in bottom or sides*

- Loosely packed, clean Fenton "Teddy Bear" cullet, mostly whole

- Kiln never opened*

**Program:**

West kiln #1, mold centered on a 20" kiln shelf, hard-brick tripod support

<table>
<thead>
<tr>
<th>Stage #</th>
<th>Program Mode</th>
<th>Temp. Goal F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ramp</td>
<td>575</td>
<td>1 hr 30 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>575</td>
<td>20 min</td>
</tr>
<tr>
<td>2</td>
<td>Ramp</td>
<td>928</td>
<td>45 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>928</td>
<td>20 min</td>
</tr>
<tr>
<td>3</td>
<td>Ramp</td>
<td>1550</td>
<td>1 hr 30 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1550</td>
<td>10 min</td>
</tr>
</tbody>
</table>
Program (con’t)

<table>
<thead>
<tr>
<th></th>
<th>Ramp</th>
<th></th>
<th>Dwell</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>928</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>800</td>
<td></td>
<td>15 hrs</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>100</td>
<td></td>
<td>60 hrs</td>
<td></td>
</tr>
</tbody>
</table>

Results:

- Mixed results
- Appears well annealed
- Mold extremely decomposed
- Mold material releases well with little residue
- Glass surface (top) is glossy with no devitrification
- Side edges and back (bottom) surface of the glass casting have a matt textured quality due to contact with the mold
- Glass clarity is excellent
- Possible impression from mold; moderate detail retention
- Impressed image visible through front surface, though confused with the "break-up" lines suggested by the technique of sinking the image pieces into the mold floor; too much light refracted internally
- Incomplete glass melt; chunks of cullet fused together in rounded rock-like forms, creating a lumpy perimeter border around central image
- No blueish coloration in the glass
- Final size approximately 12 1/2" x 12 1/2" x 3 1/4"
- Weight is 24 pounds
**SCHEDULE 3**

**Mold #2, Trial 3**

Date: 12/12/89

*Denotes new factor

**Mold Mix Formula by % of ingredients:**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>32%</td>
</tr>
<tr>
<td>Silica Flour</td>
<td>63%</td>
</tr>
<tr>
<td>Alumina</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

(aerated with Dawn detergent; 2 handfuls of vermiculite added)

**Variables:**

- Plaster mold reinforced with 3" chicken wire, all sides and bottom
- Wall thickness is 3"
- Natural air-dried cure (not covered with plastic)*
- Wet fired (mold still cold/damp)
- Mold fired flat on shelf
- No air holes drilled in bottom and sides
- Loosely packed, clean Fenton "Teddy Bear" cullet
- Kuegler powdered glass color sifted onto design in places on bottom of the mold to emphasize detail and strengthen the emotional impact*
  - used Kuegler color # (steel blue) and # (black)

**Program:**

West kiln #2, mold centered on a 20" kiln shelf, hard-brick tripod support

<table>
<thead>
<tr>
<th>Stage #</th>
<th>Program Mode</th>
<th>Temp. Goal F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ramp</td>
<td>928</td>
<td>3 hrs</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>928</td>
<td>45 min</td>
</tr>
<tr>
<td>2</td>
<td>Ramp</td>
<td>1265</td>
<td>1 hr 15 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1265</td>
<td>30 min</td>
</tr>
<tr>
<td>3</td>
<td>Ramp</td>
<td>1575</td>
<td>1 hr 15 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1575</td>
<td>15 min</td>
</tr>
<tr>
<td>Program (con't)</td>
<td>Ramp</td>
<td>Dwell</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>928</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>928</td>
<td>24 hrs</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>800</td>
<td>15 hrs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>100</td>
<td>60 hrs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Results:**

- Generally good results
- Appears well annealed
- Mold appears to have held up well; still firm; only hairline cracks, no splits
- Mold material releases well with little residue
- Glass surface (top) is smooth and glossy with some devitrification swirls
- Side edges and back (bottom) surface of the glass casting have a matt textured quality due to contact with the mold
- Glass clarity is somewhat cloudy with medium sized veiling present; some clear areas
- Good impression from mold; strong detail retention
- Impressed image clearly visible through front surface
- Glass fully melted

- Slight blueish coloration throughout glass...probably due to the presence of powder blue cobalt used as a decolorant in the original batch for the Fenton cullet; not objectionable... appropriate to the emotional expression of the image

- Colored powders did not fire as expected; the black remained black, but the blue was fugitive... struck to a medium purple color

- Final size approximately 12 1/2" x 12 1/2" x 3 1/4"

- Weight is 26 pounds
SCHEDULE 4
Mold #2, Trial 4

Date: 12/27/89
*Denotes new factor

Mold Mix Formula by % of ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>32</td>
</tr>
<tr>
<td>Silica Flour</td>
<td>63</td>
</tr>
<tr>
<td>Alumina</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

(aerated with Dawn detergent; 2 handfuls of vermiculite added)

Variables:
- Plaster mold reinforced with 3" chicken wire, all sides and bottom
- Wall thickness is 3"
- Natural air-dried cure (not covered with plastic)
- Wet fired (mold still cold/damp)
- Mold fired flat on shelf
- No air holes drilled in bottom and sides
- Loosely packed, clean Fenton "Teddy Bear" cullet; lots of bases used which are thinner pieces of glass than the teddy bear forms
- Kuegler powdered glass color sifted onto design in places on bottom of the mold to emphasize detail and strengthen emotional impact
  - used Kuegler color # (steel blue) and # (black)

Program:

West kiln #2, mold centered on a 20" kiln shelf, hard-brick tripod support

<table>
<thead>
<tr>
<th>Stage #</th>
<th>Program Mode</th>
<th>Temp. Goal _F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ramp</td>
<td>928</td>
<td>4 hrs 30 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>928</td>
<td>45 min</td>
</tr>
<tr>
<td>2</td>
<td>Ramp</td>
<td>1265</td>
<td>1 hr 15 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1265</td>
<td>30 min</td>
</tr>
<tr>
<td>3</td>
<td>Ramp</td>
<td>1575</td>
<td>1 hr 15 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1575</td>
<td>15 min</td>
</tr>
</tbody>
</table>
Program (con’t)

| 4 | Ramp | 928 | 0 |
|   | Dwell | 928 | 24 hrs |
| 5 | Ramp | 800 | 15 hrs |
|   | Dwell | 0 |
| 6 | Ramp | 100 | 60 hrs |
|   | Dwell | 0 |

Results:

- Generally good results
- Appears well annealed
- Mold appears to have held up well; still firm; only hairline cracks, no splits
- Mold material releases well with little residue
- Glass surface (top) is smooth and glossy with some devitrification swirls
- Side edges and back (bottom) surface of the glass casting have a matt textured quality due to contact with the mold
- Glass clarity is somewhat cloudy with medium sized veiling present; some clear areas
- Good impression from mold; strong detail retention
- Impressed image clearly visible through front surface
- Glass fully melted
- Slight blueish coloration throughout glass...probably due to the presence of powder blue cobalt used as a decolorant in the original batch for the Fenton cullet; not objectionable... appropriate to the emotional expression of the image
- Colored powders did not fire as expected; the black remained black, but the blue was fugitive... struck to a medium purple color
- Final size approximately 12 1/2" x 12 1/2" x 3 1/4"
- Weight is 27 pounds
CHAPTER 2

TECHNICAL DOCUMENTATION OF PRODUCTION PROCESS TRIALS
VACU-FORMS #1 - 9 FOR THE WALL CASTINGS
 RESULTING IN IN MEMORY OF... CASTING

The following schedules represent working documentation of the mold making and casting trials involving Vacu-forms #1 - 9. The schedules for the molds are outlined as follows:

Date
Mold mix
Variables
Results
Possible Solutions

The schedules for the casting trials are organized in this manner:

Date
Variables
Firing Program
Results
Possible Solutions

They are listed in chronological order and are included for the purpose of documentation and comparison.

These nine forms represent the three figures (PANIC, STRUGGLE, and DEPRESSION), each in three segments, which comprise the sculptural image THE WALL. The original images were sculpted in clay, from which polyethylene vacu-forms
were created and functioned as the reuseable masters for all trial molds. The original intent was to produce a wall unit of these three figures in cast glass, three segments per figure. Each cast block was to be approximately 25 1/2"h x 18"w x 3 1/2" thick.

The figures were to be formed by casting over relief molds to create a negative impression on the back of the casting as if they were "trapped" in the glass block. They were to be viewed through the smooth front surface of the casting which would enhance the three-dimensional effect. The three blocks would be secured vertically in a free-standing, welded steel construction which would serve as the visual "trap", allowing the figures to appear continuous within the frame-work and the viewer to walk completely around them to consider them from all angles. The figures would be life size which would have the psychological effect of "mirroring" the viewer's perspective and promoting an easier "transference" with the image, thus providing the greatest opportunity of triggering the desired emotional response.³

³According to Dr. Mary Nobilski, psychiatric resident at Strong Memorial Hospital, Rochester, NY, larger-than-life size images have a tendency to intimidate the viewer, causing them to withdraw from interaction; smaller-than-life size images encourage the viewer to take them less seriously, as one would a caricature or cartoon, thereby dismissing the emotional impact. Life-size images produce the strongest sense of identity in the viewer.
Producing cast blocks of this volume prooved to be an extraordinary challenge which was made more difficult by a series of technical difficulties involving equipment and materials. Multiple efforts were mounted to achieve the original design format, all of which are documented in the following schedules. Each firing provided additional information required to successfully complete the castings, and a sizeable amount of time, money and energy was expended in taking the necessary measures to correct the problems that were apparent. This includes altering equipment by enhancing insulation factors and installing new elements, as well as experimenting with a variety of glass types and firing/annealing schedules.

In the end, the decision was made to abandon the concept of casting the figures for THE WALL (they were subsequently slumped as an alternative), and settling instead to present the one successful casting (Fig. 1, PANIC, head section) as a supportive, independant work entitled IN MEMORY OF... This work was mounted on a charcoal gray pedestal at floor level, suggestive of a grave marker, and served as a memorial for those souls who are still trapped, waiting for our help, or the ones we are too late for. The PANIC head is visible through the thick, pale blue veiling as a screaming, tortured spirit, frozen into silence; a helpless ghost to haunt our memory.
Procedure for Sculpting the Original Figures

I first looked at the issue of "entrapment" and made an attempt to reduce the emotional response to that predicament to three basic stages. The stages I settled on were panic, struggle and depression. I then tried to envision gestures that would best express the essence of each emotional reaction, sketching each pose in a general manner.

I then determined what was the minimal width of space a grown human good be confined in and still while retaining the ability to assume those gestural responses. The size turned out to be a space of approximately 20" in width. I constructed a wooden frame to define that space, and set up a photo shoot with a live model.

I had a motivational pre-session with the model to set the mood for the shoot, then took slides of him as he assumed poses that reflected his reaction to the three emotional stages. The model was photographed within the confines of the wooden "trap" to convey the volume of space the figures would eventually occupy.

The slides were later edited for their emotional and aesthetic content, then projected, life size, onto white paper. The image was traced and cut out for use as an
initial outline for the sculpted figure.

The figures themselves were sculpted in stoneware clay #264 cone 8-10, which contained a high percentage of grog. The clay was cut into 1" thick slabs and pressed onto 3/4" plywood mounting boards which had been wiped with water to encourage adhesion. These boards measured 26" x 18", and were framed with 1/2" quarter round moulding mitred and set in 1" from all sides. The rounded side was positioned toward the outside of the board, creating a soft edge that would allow an easier release for the vacu-forms.

The wood/clay panels were arranged in groups of three to suggest the actual space that would contain the figures. All three panels of each figure were sculpted as a single panel to achieve the sense of one, continuous figure. The paper outline was used as an initial guide, as were 8 1/2" x 11" color copies of slides of the model. The only figure that resulted from those slides was DEPRESSION. They evolved naturally through my own posing in front of a mirror and the use of some friends who were willing to stand (oppressively) still for a while.

The clay needed to be kept very wet at all times, and was covered by plastic whenever possible. The images were altered several times during their birth before being
finally allowed to become leather hard. The final figures were studded with 1/2" to 1 1/4" drywall screws (to hold the clay in place during the vacu-forming process), patched, then drilled full of air holes. Many small holes were needed, particularly around the raised areas, to ensure the vacu-form would assume the exact form of the clay. Retention of detail was a primary concern.

The vacu-forms were made at a plastics company, Papago Plastics, in Rochester, NY, who was gracious enough to spend a lot of time and man-hours experimenting with different materials and amounts of heat and time. The product we decided on was white poly-ethylene plastic, which, in addition to the marvelous job it did in retaining the details of the images, is also flexible and solvent resistant. I can re-use them indefinitely as either positive or negative models. The use of this industrial process in a fine art application was a complete success!
Large Mold Specifications

The molds used to cast the large glass blocks presented their own technical difficulties. They were produced from a two part wooden box mold, an inner box on which the vacu-form was mounted, and an outer containment box. The first mold was poured in layers, which was unworkable due to the separation at the striations. The successive molds were poured from a single batch, and required approximately 150 pounds of dry mix per mold. The weight of the wet molds exceeded 300 pounds, requiring the use of an engine hoist to lift them into the kiln.

The large volume of plaster necessitated the use of a professional grade plastic 6.5 cubic foot wheelbarrow to assure the mixture's consistencey. A team of four people were needed to accomplish the mixing/pouring/releasing operation which took, on average, three hours to complete. This time was in addition to the preparation time of about 3 hours and another few hours for clean-up duties. All in all, each mold represented a major investment in time and money. The molds were of the break-away type, one-time use only. A new mold was required for each trial. As such, a good portion of my attention was devoted to developing the most effecient and reliable method of pouring these molds to obtain predictable, successful results. After considerable
effort, this was accomplished. The final specifications of the useable molds were as follows:

- Each mold took the form of a one piece, plaster box with four sides and a bottom; the image appeared as a positive relief on the interior base of the box.

- All molds had 2" thick side walls.

- The interior dimension of the mold was 25 1/2"l x 18"w x 9 1/4"h.

- The exterior dimension of the mold was 29 1/2"l x 22 1/4"w x 11"h.

- The actual volume of each mold varied depending on the volume of the mold relief of the figure (the more/higher the figure relief, the less glass needed to fill the mold).^4

---

^4The procedure for determining correct glass volume is outlined in Schedule 12 as developed by Dr. Edith Cook, Associate Professor of Mathematics, Suffolk University, Boston, MA.
Date: 1/19/90

Mold Mix Formula by % of ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>38</td>
</tr>
<tr>
<td>Silica Flour</td>
<td>56</td>
</tr>
<tr>
<td>Alumina</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Variables:

- Pam "release" used on interior box and vacu-form
- Duck taped top and sides of interior box
- Corrugated cardboard cushion wrapped around outsides of interior box
- Cardboard cushion coated with petroleum jelly and wrapped in plastic wrap
- Plasticene coiled seal where interior box meets table
- No seal around inside or outside edge of exterior box
- No weights on outside box
- Plaster mold reinforced with 3" chicken wire, all sides and bottom
- Wall thickness is positioned to be 2"
- Small screw eyes attached, 2 per side, to inside of interior box; picture hanging wire strung between them
- Styrofoam peanuts packed inside interior box to prevent collapse from the weight of the plaster
- 2 people pour:
  - Five 3/4 full 20 gallon buckets
  - Poured at table height
  - Plastic wrap on table under mold box
  - Very dense mix of plaster/water using "island" method
  - Thick pour

Results:

Total failure

- Inside box not removeable
- Cardboard shredded, stuck
Results (con’t)

- Plastic wrap shrunk, wrinkled, stuck
- Picture wire broke; screw eyes did not hold...pulled out
- Plaster striated, separated
- Had to saw mold apart and discard

Possible Solutions

- Eliminate cardboard and plastic wrap
- Apply petroleum jelly on the sides and lip of inside box and "pam"
- Use larger screw eyes and nylon rope for pulls
- Put two screw eyes and rope on one side of outside box to allow for flipping the mold over
- Put air release holes in vacu-form to reduce suction
- Possibly add draft to the outsides of the interior box
- Possibly use compressed air to help break suction
- Mix and pour as a single batch to improve consistencey, prevent striations
- Pour at floor level (more leverage) on a semi-rigid plastic mat
- Use more people for the pour
- Use cooler water to extend time for pour, slow setting time
Date: 1/21/90

*Denotes new factor

**Mold Mix Formula by % of ingredients:**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>38%</td>
</tr>
<tr>
<td>Silica Flour</td>
<td>56%</td>
</tr>
<tr>
<td>Alumina</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Variables:**

- Pam "release" and petroleum jelly used on interior box and vacu-form*
- Duck taped top and sides of interior box*
- No corrugated cardboard cushion wrapped around outsides of interior box*
- Interior box coated with petroleum jelly*
- Plasticene coiled seal where interior box meets floor
- No seal around inside or outside edge of exterior box
- No weights on outside box
- Plaster mold reinforced with 3" chicken wire, all sides and bottom
- Wall thickness is positioned to be 2"
- Large screw eyes attached, 2 per side, to inside of interior box; nylon rope strung between them*
- Two large screw eyes attached to one outside panel of exterior box with nylon rope pull for flipping mold after pour*
- Two 1/4" air holes drilled in vacu-form to reduce suction*
- Single batch pour using 6.5 cu. ft. wheelbarrow*
  - Five 1/2 buckets (25 gal.) of cooler water;
  - Very dense mix of plaster/water using "island" method
  - Thick pour
- Three people used for pour*
- Poured on floor on plastic mat*
- Styrofoam peanuts packed inside interior box to prevent collapse from the weight of the plaster
Results:

Partial failure (unuseable)

- Inside box removeable, but exterior box shifted during pour, producing 1/8" and 4" side walls instead of 2" on all sides
- Major leaking from beneath exterior wall
- Cracks in mold walls
- Good mold impression
- Mold discarded

Possible Solutions

- Seal lower edge of exterior box with plasticene to prevent leaks
- Position 2" plaster spacers, two per side, near corners in the wall section between the interior and exterior mold boxes to prevent shifting
- Try more air release holes in vacu-form to reduce suction
- Weight outside corners of exterior box to reduce shifting
- Flip mold more softly to reduce stress and chance of cracks
SCHEDULE 7
LARGE PLASTER MOLD TRIALS
Figure 3, Bottom
Trial 3

Date: 1/22/90

*Denotes new factor

Mold Mix Formula by % of ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>38%</td>
</tr>
<tr>
<td>Silica Flour</td>
<td>56%</td>
</tr>
<tr>
<td>Alumina</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Variables:

- Pam "release" and petroleum jelly used on interior box and vacu-form
- Duck taped top and sides of interior box
- No corrugated cardboard cushion wrapped around outsides of interior box
- Interior box coated with petroleum jelly
- Plasticene coiled seal where interior box meets floor
- Duck tape seal around inside and outside edge of exterior box*
- 2" plaster spacers inserted into wall area near all corners*
- Weights on top corners of outside box*
- Plaster mold reinforced with 3" chicken wire, all sides and bottom
- Wall thickness is positioned to be 2"
- Large screw eyes attached, 2 per side, to inside of interior box; nylon rope strung between them
- Two large screw eyes attached to one outside panel of exterior box with nylon rope pull for flipping mold after pour
- More (total of four) 1/4" air holes drilled in vacu-form to reduce suction*
- Single batch pour using 6.5 cu. ft. wheelbarrow
  - Five 1/2 buckets (25 gal.) of cooler water;
  - Thirteen full 5 gal. buckets of mix used instead of the "island" method*
  - Thin pour*
  - Separate "splash" coat before full pour...same batch*
  - Mixture aerated with a drill blender*
  - Three handfuls of vermiculite added
Variables (con’t)

- Three people used for pour
- Poured on floor on plastic mat
- Styrofoam peanuts packed inside interior box to prevent collapse from the weight of the plaster
- Soft flip with outside box in place

Results:

Success (some repair needed)

- Inside box removeable, but part of the thumb and toe cracked off
- Part of form was compressed before pour and was not corrected; part of the relief (leg) was affected; needed to be rebuilt to fill in area
  - Used lots of warm water to keep mold wet and partially set plaster; did crack and powder when dry
- Even side walls
- Less leaking from beneath exterior wall
- Good mold impression
- Cleaned and vacuumed
- Set for one day in wooden box before moving
- Moved to kiln shelf on blocks on second day

Possible Solutions

- Seal lower edge of exterior box with plasticene to prevent leaks
- Wait longer before pulling out interior box to prevent relief from cracking
- Use more pam on vacu-form
- Try more air release holes in vacu-form to reduce suction
SCHEDULE 8

LARGE PLASTER MOLD TRIALS

Figure 3, Middle

Trial 1

Date: 1/23/90

*Denotes new factor

Mold Mix Formula by % of ingredients:

- Hydrocal 38%
- Silica Flour 56%
- Alumina 6%
- Total 100%

Variables:

- Pam "release" and petroleum jelly used on interior box and vacu-form
- Duck taped top and sides of interior box
- No corrugated cardboard cushion wrapped around outsides of interior box
- Interior box coated with petroleum jelly
- Plasticene coiled seal where interior box meets floor
- Duck tape seal around inside and outside edge of exterior box
- 2" plaster spacers inserted into wall area near all corners
- Weights on top corners of outside box
- Plaster mold reinforced with 3" chicken wire, all sides and bottom
- Wall thickness is positioned to be 2"
- Large screw eyes attached, 2 per side, to inside of interior box; nylon rope strung between them
- Two large screw eyes attached to one outside panel of exterior box with nylon rope pull for flipping mold after pour
- More (total of five) 1/4" air holes drilled in vacu-form to reduce suction*
- Single batch pour using 6.5 cu. ft. wheelbarrow
  - Five 1/2 buckets (25 gal.) of cooler water;
  - Thirteen full 5 gal. buckets of mix used instead of the "island" method
  - Thin pour
  - Separate "splash" coat before full pour...same batch
  - Mixture aerated with a drill blender
  - Three handfuls of vermiculite added
Variables (con't)

- Three people used for pour
- Poured on floor on plastic mat
- Styrofoam peanuts packed inside interior box to prevent collapse from the weight of the plaster
- Soft flip with outside box in place
- Used four people to pull interior box, one on each corner, foot braced on outer edge of wooden box; pulled fast (one pull)

Results:

Success (small repair needed)

- Inside box stuck at first; inserted hand saw between inside box and inside surface of plaster mold wall; worked saw to loosen
- Nose cracked off (patched)
- Sides firm
- Even side walls
- Major leak from beneath exterior wall
- Set for one day in wooden box before moving
  - Outer box popped open (screws pulled loose) after one day of setting
- Cleaned and vacuumed
- Moved to kiln shelf on blocks on second day

Possible Solutions

- Seal lower edge of exterior box with plasticene to prevent leaks (including inside wall)
- Wait longer before pulling out interior box to prevent relief from cracking
- Use more pam on vacu-form
- Try more air release holes in vacu-form to reduce suction
- Reposition screws on exterior box to correct for the old ones having pulled out; construct another mold box in hard wood
- Wrap a strip of duck tape around the perimeter of the mold to stop pressure from forcing screws outward
SCHEDULE 9
LARGE PLASTER MOLD TRIALS

Figure 1, Top
Trial 1

Date: 1/30/90

*Denotes new factor

Mold Mix Formula by % of ingredients:*

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>39</td>
</tr>
<tr>
<td>Silica Flour</td>
<td>59</td>
</tr>
<tr>
<td>Alumina</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
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</tbody>
</table>

Variables:

- Pam "release" and petroleum jelly used on interior box and vacu-form
- Duck taped top and sides of interior box
- No corrugated cardboard cushion wrapped around outsides of interior box
- Interior box coated with petroleum jelly
- Plasticene coiled seal where interior box meets floor
- Plasticene seal around inside and outside edge of exterior box*
- 2" plaster spacers inserted into wall area near all corners
- Weights on top corners of outside box
- Plaster mold reinforced with double thickness 3" chicken wire on sides, single layer on bottom*
- Wall thickness is positioned to be 2"
- Large screw eyes attached, 2 per side, to inside of interior box; nylon rope strung between them
- Two large screw eyes attached to one outside panel of exterior box with nylon rope pull for flipping mold after pour
- Aluminum flashing corner pieces used to reinforce outer corners of the wooden mold box*
- More (total of five) 1/4" air holes drilled in vacu-form to reduce suction
- Single batch pour using 6.5 cu. ft. wheelbarrow
  - Five 1/2 buckets (25 gal.) of cooler water;
  - Thirteen full 5 gal. buckets of mix used instead of the "island" method
- Thin pour
Variables (con’t)

- Separate "splash" coat before full pour...same batch
- Mixture aerated with a drill blender
- Three handfuls of vermiculite added

- Three people used for pour
- Used four people to pull interior box, one on each corner, foot braced on outer edge of wooden box;
- Poured on floor on plastic mat; plastic sheet covering entire floor*
- Styrofoam peanuts packed inside interior box to prevent collapse from the weight of the plaster
- Soft flip with outside box in place

Results:

Success (small repair needed)

- Nose and part of thumb cracked off (patched)
- Sides firm
- Even side walls
- Very little leakage from beneath exterior wall
- Good impression
SCHEDULE 10
LARGE PLASTER MOLD TRIALS

Figure 1, Middle
Trial 1

Date: 2/17/90

*Denotes new factor

Mold Mix Formula by % of ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>40%</td>
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<tr>
<td>Silica Flour</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Variables:

- Pam "release" and petroleum jelly used on interior box and vacu-form; petroleum jelly on high points of form*
- Duck taped top and sides of interior box
- No corrugated cardboard cushion wrapped around outsides of interior box
- Interior box coated with petroleum jelly
- Plasticene coiled seal where interior box meets floor
- Plasticene seal around inside and outside edge of exterior box
- 2" plaster spacers inserted into wall area near all corners
- Weights on top corners of outside box
- Plaster mold reinforced with double thickness 3" chicken wire wrapped as a strip around the sides, single layer on bottom*
- Wall thickness is positioned to be 2"
- Large screw eyes attached, 2 per side, to inside of interior box; nylon rope strung between them
- Two large screw eyes attached to one outside panel of exterior box with nylon rope pull for flipping mold after pour
- Aluminum flashing corner pieces used to reinforce outer corners of the wooden mold box
- More (total of eight) 1/4" air holes drilled in vacu-form to reduce suction*
- Single batch pour using 6.5 cu. ft. wheelbarrow
  - Five 1/2 buckets (25 gal.) of cooler water;
  - Fourteen full 5 gal. buckets of mix used instead of the "island" method*
  - Thin pour
  - Separate "splash" coat before full pour...same batch
Variables (con’t)

- Mixture aerated with a drill blender
- No vermiculite added

- Three people used for pour
- Used four people to pull interior box, one on each corner, foot braced on outer edge of wooden box;
- Poured on floor on plastic mat; plastic sheet covering entire floor
- Styrofoam peanuts packed inside interior box to prevent collapse from the weight of the plaster
- Soft flip with outside box in place

Results:

Perfect success*

- No patching necessary!
- No leaks!
SCHEDULE 11
LARGE PLASTER MOLD TRIALS
Figure 1, Bottom
Trial 1

Date: 2/18/90

*Denotes new factor

Mold Mix Formula by % of ingredients:*

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocal</td>
<td>33%</td>
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<tr>
<td>Silica Flour</td>
<td>66%</td>
</tr>
<tr>
<td>Alumina</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Variables:

- Pam "release" and petroleum jelly used on interior box and vacu-form; petroleum jelly on high points of form
- Duck taped top and sides of interior box
- No corrugated cardboard cushion wrapped around outsides of interior box
- Interior box coated with petroleum jelly
- Plasticene coiled seal where interior box meets floor
- Plasticene seal around inside and outside edge of exterior box
- 2" plaster spacers inserted into wall area near all corners
- Weights on top corners of outside box
- Plaster mold reinforced with double thickness 3" chicken wire wrapped as a strip around the sides, single layer on bottom
- Wall thickness is positioned to be 2"
- Large screw eyes attached, 2 per side, to inside of interior box; nylon rope strung between them
- Two large screw eyes attached to one outside panel of exterior box with nylon rope pull for flipping mold after pour
- Aluminum flashing corner pieces used to reinforce outer corners of the wooden mold box
- More (total of eight) 1/4" air holes drilled in vacu-form to reduce suction
- Single batch pour using 6.5 cu. ft. wheelbarrow
  - Five 1/2 buckets (25 gal.) of cooler water;
  - Fourteen full 5 gal. buckets of mix used instead of the "island" method
  - Thin pour
Variables (con’t)

-Separate "splash" coat before full pour...same batch
-Mixture aerated with a drill blender
-No vermiculite added

-Three people used for pour

-Used four people to pull interior box, one on each corner, foot braced on outer edge of wooden box;

-Poured on floor on plastic mat; plastic sheet covering entire floor

-Styrofoam peanuts packed inside interior box to prevent collapse from the weight of the plaster

-Soft flip with outside box in place

Results:

Perfect success

-No patching necessary!

-No leaks!
SCHEDULE 12

DETERMINING THE AMOUNT OF GLASS NEEDED TO FILL A MOLD

Step 1

- Weigh a piece of glass; record weight in pounds (#)

Step 2

- Add glass to a graduated container of water; notate the amount of water displaced by the glass (in fluid ounces)

Step 3

- The water density factor is: $\frac{\text{weight of glass (#)}}{\text{water displaced (fl. oz.)}}$

  ie. One piece of glass weighs 12 oz. = $\frac{3}{4}$ #, which displaces 4 fl. oz. of water, therefore:

  $\frac{3}{4} \text{ or } \frac{3}{16} = 0.1875^\ast$  (\* this factor is the constant, referred to as the water density, known as D)

Step 4

- Determine the amount of water (in fl. oz.) needed to fill the mold to the desired depth:

  - Actually pour water into mold to mark, siphon off and measure

  OR

  - Calculate volume of empty cube (l x w x h) in cubic inches and convert to fl. oz. using the following conversion:

    - 231 cubic inches = 1 gallon = 128 fluid ounces

  - Calculate volume of vacu-form relief by pouring water into the negative side of the form and measuring the amount needed to fill it

  - Subtract the volume of the relief from the volume of the empty cube; the difference is the exact volume of that mold

Step 5

- Use this formula to determine the volume of glass needed:

  - Water density (D) x water (in fl. oz.) = weight (in #’s) needed to fill mold of glass needed

5See note 3
Step 5 (con’t)

-This can be written as follows:

\[-D \times \text{volume} = \text{weight} \quad \text{OR} \quad D = \frac{\text{weight (in #’s)}}{\text{volume (in fl. oz.)}}\]

Using our original example where we determined that \( D = \frac{3}{16} \) or \(.1875\), and assuming the volume of the mold to be 52 fl. oz., the formula would work as follows:

\[-\frac{3}{16} \times 52 \text{ fl. oz.} = \frac{156}{16} = 9.75 \text{ pounds of glass needed to fill mold}\]

OR

\[-.1875 \times 52 \text{ fl. oz.} = 9.75 \text{ pounds of glass needed to fill mold}\]

As long as we use the same glass, our "constant" or water density factor (D) will always be the same. Only the variable of water volume will differ.

For reference purposes, the water density of the Fenton teddy bear cullet that I used to cast these blocks was \(.14\).
SCHEDULE 13
LARGE CASTING TRIALS
AND FIRING PROGRAMS

Figure 3, Bottom and Figure 3, Middle
Actual Fire 1

Date: 1/26/90

Variables:

-Fired in large "coffin" slumper, 60" x 25" internal dimensions using a Fire-Rite controller with set point, ramp (auto and manual), rate of increase, soak and hold capability. It is top loading, insulated with one layer soft brick sheathed in transite.

-Two molds fired together:
  -Figure 3 bottom on left; figure 3 middle on right

-Figure 3 bottom mold is one day drier than figure 3 middle

-Both molds set directly on 28" x 14", 1" thick silicon carbide shelves

-Figure 3 bottom mold supported on soft-brick, multi-rest base

-Figure 3 middle mold supported on kiln shelf fragments; slightly lower in kiln

-Lowered into kiln Friday PM; cullet washed, weighed, loaded
  -Figure 3 bottom 108 3/4 pounds of Fenton cullet
  -Figure 3 middle 115 " " " "

-No air holes drilled in molds

-Molds were fired wet

Firing Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sat. 1:45 AM Start-up</td>
<td>limit 850 F rate 55 /hr ramp 100 F</td>
</tr>
<tr>
<td>11:30 &quot;</td>
<td>( 600 F) 650 F</td>
</tr>
<tr>
<td>12:00 PM</td>
<td>( 700 F) 750 F</td>
</tr>
<tr>
<td>12:15 &quot;</td>
<td>( 750 F) 800 F</td>
</tr>
<tr>
<td>12:30 &quot;</td>
<td>( 800 F) 850 F</td>
</tr>
<tr>
<td>(remove vent)</td>
<td></td>
</tr>
<tr>
<td>12:45 &quot;</td>
<td>( 850 F) limit 928 F 928 F</td>
</tr>
<tr>
<td>1:00 &quot;</td>
<td>( 928 F) (soak at 928 F for 45 minutes) 978 F</td>
</tr>
<tr>
<td>1:45 &quot;</td>
<td>( 928 F) limit 1265 F 1028 F</td>
</tr>
<tr>
<td>2:00 &quot;</td>
<td>( 978 F) 1078 F</td>
</tr>
<tr>
<td>2:20 &quot;</td>
<td>(1028 F) 1128 F</td>
</tr>
<tr>
<td>2:30 &quot;</td>
<td>(1078 F) 1178 F</td>
</tr>
<tr>
<td>2:40 &quot;</td>
<td>(1078 F)</td>
</tr>
</tbody>
</table>

(Kiln heating too slow...way off firing schedule)

<table>
<thead>
<tr>
<th>Time</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:50 &quot;</td>
<td>(1100 F)</td>
</tr>
<tr>
<td>3:00 &quot;</td>
<td>(1100 F)</td>
</tr>
</tbody>
</table>
(Still only at 1100 F; checked for heat leaks; filled leak around doors with frax)

Sat. 3:25 " (1125 F) ramp 1575 F

(Kiln at full power; constantly on; can’t heat fast enough; problem)

3:45 " (1150 F)
3:55 " (1155 F)

(Tried laying a blanket of foil faced house insulation over doors of kiln; too hot; began to smoke; removed it)

5:10 " (1265 F)

(Added 1" fiber frax blanket to cover the entire top of kiln)

5:25 " (1280 F)
5:35 " (1300 F)

(Blanket seems to be helping)

6:20 " (1350 F)
8:00 " (1500 F)
9:30 " (1550 F)

(Opened kiln to check; molds look alright; left side of kiln is hotter than the right; both somewhat lumpy; left side more melted)

9:55 " (1550 F)

(Checked again; left mold was split on outside wall; large split at top narrowing near the glass at the bottom)

(Decided to let the kiln soak to try and melt the glass in the right mold, hoping the split would not worsen; melt down possible; loss of glass possible)

10:30 " (1575 F) limit 928 F rate 55 /hr ramp 1100 F

(Leave kiln closed; soak at 928 F for 38 hours)

Mon. 12:00 PM ( 928 F) limit 800 F rate 10 /hr (20 hours)
 Tues. 10:00 AM ( 800 F) limit 0 F rate 30 /hr (26 hours)

Results:

Failure

- Severe checks in both casts
- Heavy devitrification; very dense/dark appearance to the glass;
- Very little light transmitted through glass
- Image almost indiscernible through casting
- Molds split badly; bottom of left mold split and "fell" off kiln shelf where there was a 2" overhang
Possible Solutions:

- Increase kiln insulation (sides, back and top) to contain heat and help accelerate heating rate
- Double reinforce molds with chicken wire to stop splitting
- Band outside of molds with iron bands or wire
- Eliminate the possibility of the mold overhanging the kiln shelf; use larger shelves
- Try spraying the cullet with devitrification spray (Spray A)\(^6\) before firing
- Try drier/wetter molds
- Try lining the interior/exterior of molds with graphite sheets
- Hot wire a 110 volt element along bottom of kiln to increase heat
- Partial gas conversion using an LP gas torch inserted through wall of kiln at temperatures over 1000° F
- Lock kiln during come-down to avoid accidental opening and resultant thermal shock

Date: 2/6/90
*Denotes new factors or changes

Variables:

-Fired in large "coffin" slumper, 60" x 25" internal dimensions using a Fire-Rite controller with set point, ramp (auto and manual), rate of increase, soak and hold capability. It is top loading, insulated with one layer soft brick sheathed in transite.

-Additional insulation applied to the kiln externally;*
  -1" 8# densitly frax blanket strapped onto all four sides shielded on front and sides with aluminum flashing and banded on with 2 strips of iron banding
  -Two 5' lengths of blanket laid over top; strips fitted around the doors

-Only one mold fired:*
  -Centered in the kiln

-Mold was dried for an entire week (was poured 1/30/90)*

-Mold set directly on three 11" x 22", 1" thick silicon carbide shelves with no overhangs; multiple low supports under shelves*

-Lowered into kiln Tuesday PM; cullet washed, weighed, loaded*
  -Figure 1 top 103 pounds of Fenton cullet (3 1/4")

-Glass loaded into a mound into center, away from sides*

-Devitrification spray (Spray A) airbrushed over each layer of cullet*

-No air holes drilled in molds

-Mold was fired dry

-Galvanized sheet metal corner angles fitted over outer corners of the mold to shield from heat, reduce splitting; secured to mold with iron band joined by copper and nichrome wire

Firing Program:*

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Temperature</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tues. 8:13 PM</td>
<td>Start-up</td>
<td>limit 850 F</td>
<td>55 /hr ramp 100 F</td>
</tr>
<tr>
<td>Wed. 10:55 AM</td>
<td>(850 F)</td>
<td>limit 1050 F</td>
<td>928 F</td>
</tr>
<tr>
<td>11:05 &quot;</td>
<td>(928 F)</td>
<td>(soak at 928 F for 15 minutes) 928 F</td>
<td></td>
</tr>
<tr>
<td>11:20 &quot;</td>
<td>(928 F)</td>
<td>limit 1265 F</td>
<td>1125 F</td>
</tr>
<tr>
<td>11:45 &quot;</td>
<td>(1150 F)</td>
<td>1200 F</td>
<td>auto F</td>
</tr>
<tr>
<td>12:05 PM</td>
<td>(1200 F)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Wed. 12:20 "  (1250 F)  (soak at 1265 F)
12:45 "  (1265 F)  (soaking)
  1:05 "  (1265 F)  limit 1575 F  1350 F
  1:30 PM  (1350 F)  ramp  1450 F
  1:35 "  (1400 F)
  2:05 "  (1475 F)  1550 F

(Part of frax blanket covering left door appeared to be
smoldering...really some substance on the door itself; tore off corner
of frax)

2:37 "  (1540 F)  1575 F
3:00 "  (1575 F)  limit 1600 F

(Glass is still lumpy)

3:10 "  (1600 F)  (still lumpy; soak at 1600 F)
3:25 "  (1600 F)  "  "
3:35 "  (1600 F)  limit 1575 F
3:40 "  (1575 F)  limit 1600 F
4:00 "  (1600 F)  limit 928 F  10 /hr  ramp 1150 F

(Appears fairly flat; 2 large bubbles near surface but not yet burst;
decided to begin turn-down before more bubbles rise to surface forming
crators; locked kiln)

4:15 "  (1350 F)
4:40 "  (1250 F)
5:00 "  (1200 F)
5:25 "  (1140 F)
6:00 "  (1050 F)

Thur. 2:30 PM  ( 928 F)  (has been soaking)

(Leave kiln closed; soak at 928 F)

Fri. 12:15 PM  ( 928 F)  limit 800 F  2 /hr  (64hrs/38min
based on 8" thickness)

Mon. 10:40 AM  ( 800 F)  limit 80 F  16 /hr  (45 hours)

Results:

Useable Cast

-No checks

-Some devitrification; very dense/dark appearance to the
glass;

-Very little light transmitted through glass

-Image obsured yet discernible through casting

-Molds showed some fractures but no splits

-No bottom leakage

-Good mold impression

-No side "smears"

-Kiln shelves held up well
Results (con't)

- Not "cold" until Friday... long time

- Iron band has slipped down around bottom of mold
  - doesn't seem to be doing much good

- Corner brace protectors may have helped minimize mold splitting on the corners, but are not reuseable

Possible Solutions:

- Try spraying the cullet with more devitrification spray (Spray A) before firing
SCHEDULE 15

LARGE CASTING TRIALS
AND FIRING PROGRAMS

Figure 1, Middle and Figure 1, Bottom

Actual Fire 3

Date: 2/22/90

*Denotes new factors or changes

Variables:

-Fired in large "coffin" slumper, 60" x 25" internal dimensions using a Fire-Rite controller with set point, ramp (auto and manual), rate of increase, soak and hold capability. It is top loading, insulated with one layer soft brick sheathed in transite.

-Additional insulation applied to the kiln externally;
  -1" 8# density frax blanket strapped onto all four sides shielded on front and sides with aluminum flashing and banded on with 2 strips of iron banding
  -Two 5' lengths of blanket laid over top; strips fitted around the doors

-Two molds fired:*  
  -Figure 1 bottom on left; figure 1 middle on right

-Figure 1 middle poured Sat. 2/17/90*

-Figure 1 bottom poured Sun. 2/18/90*

-Molds set directly on five 1" thick silicon carbide shelves with no overhangs; multiple low supports under shelves*

-Thick layer of silica flour sifted unto shelves*

-Lowered into kiln Wednesday PM; cullet washed, weighed, loaded*
  -Figure 1 bottom 103 pounds of Fenton cullet (3 1/4")
  -Figure 1 middle 96 " "

-Glass loaded into a mound into center, away from sides

-Devitrification spray (Spray A) airbrushed over each layer of cullet

-1/4" air holes drilled in molds on all four sides near bottom joint, angled down; drilled while in kiln*

-Moderately dry fire*

-No iron banding or sheet metal corners used

Firing Program:*

Thur. 3:30 AM Start-up limit 850 F 55 /hr ramp 80 F
3:00 PM ( 700 F)
Thur.  7:10 PM  ( 850 F)  limit 1000 F   925 F
7:30 "  ( 950 F)   975 F
7:45 "  ( 975 F)   1125 F
8:10 "  (1150 F)   1200 F
8:20 "  (1175 F)   1205 F
8:35 "  (1200 F)   1265 F
8:50 "  (1250 F)   1350 F
9:05 "  (1265 F)   (soaking)
9:20 "  (1265 F)   limit 1575 F  1450 F
9:30 "  (1300 F)   1575 F
9:55 "  (1350 F)   1450 F
10:20 "  (1400 F)   1575 F
10:40 "  (1410 F)   (soaking)
10:55 "  (1450 F)   (remove top blankets)
11:15 "  (1475 F)   (soaking)
11:45 "  (1500 F)   (remove top blankets)

Fri.  12:00 AM  (1525 F)
12:15 "  (1550 F)
12:30 "  (1560 F)
12:45 "  (1575 F)   limit 1600 F
1:15 "  (1600 F)   (soaking)

(Glass still lumpy)
1:30 "  (1625 F)   (soaking)

(Left side almost flat; right side still lumpy)
1:45 "  (1600 F)   limit 1700 F
2:00 "  (1650 F)
2:10 "  (1660 F)
2:20 "  (1675 F)
2:30 "  (1700 F)   (soaking)
2:40 "  (1700 F)   limit 1750 F

(Both sides flat; major bubbles on right; no bubbles visible on left)
3:20 "  (1700 F)
3:30 "  (1720 F)   limit 928 F 10 /hr. ramp 1050 F

(No visible improvement; large bubbles on right; decided to bring down)

(Remove front insulation; wedge vent both sides 1"; flash vent periodically)
3:45 "  (1425 F)   (remove top blankets)
4:00 "  (1375 F)
4:15 "  (1300 F)

(Tried to put frax "lids" on top of molds inside kiln; impossible to get inside kiln fast enough; too awkward; abandoned idea)*
4:45 "  (1250 F)
5:00 "  (1200 F)

(Casts appear yellowish red in color; small cracks in molds; some devitrification; knee of figure appears visible)

(Put on insulation blankets and locked kiln)
Fri.  6:20 PM  ( 950 F)
Sat.  3:30 PM  ( 928 F)   (soaking)
Sun. 4:50 PM  (928 F)  limit 800 F  2 /hr
Mon. 11:40 AM  (900 F)
4:05 PM  (880 F)
Tues. 11:50 AM  (800 F)  (soaking)
2:50 PM  (800 F)  (soaking)
5:00 "  (800 F)  limit 0 F  16 /hr
Wed. 1:05 PM  (525 F)
7:50 "  (425 F)
Thur. 9:50 AM  (250 F)
Fri. 2:00 PM  (125 F)

Results:

Failure

- Front two elements (top and middle) failed
  - Both casts badly cracked
  - Too rapid cooling
  - Uneven heat
  - Flash vent stress (?)

- Extreme devitrification; very dense/dark appearance to the glass;

- Very little light transmitted through glass

- Image indiscernible through casting

- Molds are fine

- No bottom leakage

- Good mold impression

- Kiln shelves cracked

Possible Solutions:

- Fire only one mold at a time (too much mass to heat)

- Do not flash vent

- Do not heat as long or as high

- Do not hold at top temperature for as long a period

- Do not open kiln on come down
SCHEDULE 16
LARGE CASTING TRIALS
AND FIRING PROGRAMS

Figure 3, Middle
Actual Fire 4

Date: 3/8/90
*Denotes new factors or changes

Variables:

-Fired in large "coffin" slumper, 60" x 25" internal dimensions using a Fire-Rite controller with set point, ramp (auto and manual), rate of increase, soak and hold capability. It is top loading, insulated with one layer soft brick sheathed in transite.

-Additional insulation applied to the kiln externally;
  -1" 8# density frax blanket strapped onto all four sides shielded on front and sides with aluminum flashing and banded on with 2 strips of iron banding
  -Two 5' lengths of blanket laid over top; strips fitted around the doors

-One mold fired:*  
  -Figure 3 middle centered in kiln

-Mold poured Friday 3/2/90*

-Mold set directly on 1" thick silicon carbide shelves with no overhangs; multiple low supports under shelf*

-New elements installed in kiln (front top and middle)

-Thick layer of silica flour sifted unto shelf

-Lowered into kiln Wednesday PM; cullet washed, weighed, loaded*  
  -Figure 3 middle 106 pounds of W-4 crystal cullet* (3 1/4"")

  -Glass loaded into a mound into center, away from sides

-No devitrification spray (Spray A) used

-1/4" air holes drilled in molds on all four sides near bottom joint, angled down; drilled while in kiln

-Moderately dry fire

-Sheet metal corner protectors used on mold; secured with steel wire

Firing Program:*  

Thur. 2:45 AM Start-up limit 850 F 55 /hr ramp 80 F
Thur.  1:45 PM  (700 F)
3:00 PM  (750 F)
4:25 PM  (825 F)
4:55 "  (850 F) limit 950 F
5:55 "  (900 F)
9:40 "  (950 F) (soaking)
9:50 "  (950 F) limit 1600 F  ramp 1050 F
10:20 "  (1050 F)
10:50 "  (1175 F)
11:10 "  (1325 F)
11:15 "  (1350 F)
11:30 "  (1400 F)
Fri.  12:00 AM (1475 F)
12:25 "  (1525 F)
12:55 "  (1575 F)
1:10 "  (1600 F)
1:40 "  (1650 F)
1:50 "  (1650 F) limit 1700 F
2:05 "  (1700 F)
2:25 "  (1725 F) limit 980 F 10 /hr ramp 1125 F

(Glass is mostly flat, though not very clear; begin turn-down; remove top blankets)

4:15 "  (1125 F)
3:00 PM  (1010 F)
8:00 "  (980 F) (soaking)
11:05 "  (980 F) (soaking)
Sat.  9:05 PM  (980 F) limit 800 F 2 /hr ramp auto
Sun.  12:30 PM  (925 F)
Mon.  7:10 PM  (875 F)
Tues.  9:10 AM  (850 F)
Wed.  9:30 AM  (800 F) limit 0 F 10 /hr ramp auto

Results:

Failure

- New two elements (front, top and middle) generated more heat than the older elements
  - Cast badly cracked
  - Uneven heat

- Extreme devitrification; heavy veiling; numerous small bubbles in the glass; very cloudy

- Glass stayed colorless, but full of black specks from iron deposits off the blow pipes

- Very little light transmitted through glass

- Image indiscernible through casting

- Molds are fine

- No bottom leakage

- Good mold impression

- Kiln shelves cracked
Possible Solutions:

-Conclusion is that this type of casting is not practical using the cullet source and the kilns available; decided to abandon this method in favor of slumping the figures; would try this again using lead crystal and a well-insulated, digitally controlled casting oven
CHAPTER 3

TECHNICAL DOCUMENTATION OF PRODUCTION PROCESS TRIALS
VACU-FORMS #1 - 9 FOR THE WALL SLUMPS

The following schedules represent working documentation of slumping trials involving vacu-forms #1 - 9. They are organized as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Mold mix</th>
<th>Variables</th>
<th>Firing Program</th>
<th>Results</th>
</tr>
</thead>
</table>

They are listed in chronological order and included for the purposes of documentation and comparison.

These nine forms represent the three figures (PANIC, STRUGGLE, and DEPRESSION), each in three segments, which comprise the sculptural image THE WALL. The original images were sculpted in clay, from which polyethylene vacu-forms were created and functioned as the reuseable masters for all trial molds. The original intent was to produce a wall unit of these three figures in cast glass, three segments per figure. Each cast block was to be approximately 25 1/2"h x 18"w x 3 1/2" thick. This approach was abandoned (due to technical considerations) in favor of slumping each of the figure segments.
The solution of slumping verses casting proved to be ideal for many reasons. The first (and most obvious) was the relative ease in which this could be accomplished using the equipment and controllers available to me; the second was time. However, the end results are evidence of the fact that the aesthetics and emotional impact of the work was actually enhanced by this departure. In addition, the weight factor was greatly reduced, allowing for more flexibility in the display format and transportation/storage constraints.

The slumpings differed from the castings in two significant ways: first, the slumped glass is a positive image (verses the negative impression in the castings); second, the slumps use 1/8" thick clear Bullseye hand-cast glass sheets (as opposed to the 3 1/4" thick cast cullet). This later factor resulted in colorless images of excellent clarity and brilliance as well as intriguing refractory characteristics. The positive images took on a life-like, sculptural quality, while still providing the negative contour on their reverse side. This visual and sensual feature invites the viewer to "step into" the figure from behind and become "one" with it, thus encouraging the merge between image and observer. Such a sense of physical involvement helps to foster the emotional connection, thereby fulfilling the basic intent of the work.
The molds for the slumps were pulled from the same vacu-forms used for the large plaster casting molds. However, the molds are poured over the positive side of the forms, not into them as was the case with the box molds. This resulted in mold slabs which contained the negative impressions of the figure segments, which were hence slumped into.

An entirely new mold casting system had to be developed to accomplish this variation on the original mold-making technique. However, the basic elements remained similar enough to the originals that I will choose to omit the specifics in this explanation. Suffice it to say that the same wooden mold boxes were used, but the forms were attached to the boxes in reverse orientation, creating a single box whose bottom was the negative side of the vacu-form. This slab approach eliminated the need for an interior/exterior box mold. The mold mix itself remained unchanged.

After pouring these molds, they were enhanced with clay sculpting tools to restore the detail and definition that was sacrificed when pulling off of the positive side of the vacu-form (keeping in mind that the vacu-forms were molded over the clay originals, so the detail is greatest on the inside, or negative, side of the form). This was a tedious
but necessary step in order to ensure sufficient detail retention in the final slump. The final preparation involved drilling a large number of 1/4" air holes through the plaster mold, taking care to include at least one hole in every depression in the mold. This was absolutely vital to allow the air beneath the glass to be pressed out of the mold as the slump progressed. The extent and variety of the depressions created a slumping challenge as it was, and excess air trapped within the mold would have made it impossible.

As time was a factor, the molds were still quite wet when they were fired, which accounts for the slow temperature rise built into the firing schedules. The other consideration was the size of the mold (and glass) in relation to the interior dimension of the kilns. There was not much clearance (less than 2") between the edge of the glass and the elements, so a gradual increase in temperature was essential to avoid thermal shocking the glass. This factor was over-looked in the initial firing, with disastrous results.

The actual slumping process was rather straightforward. The Bullseye glass was cut to size from stock sheets, cleaned, then positioned evenly on top of the mold slab already in the kiln. The molds and glass were heated
together, according to the following firing schedules. 
Careful visual monitoring of each piece was necessary at the 
critical slump stage (top temperature at which the glass 
softens enough to sag into the mold) to determine when the 
maximum slump had been reached. Some of the molds contained 
severe relief, and required more than one firing to fully 
accomplish the slump. 

After the slumps were complete, the glass was removed, 
cleaned, and the edges were ground on a belt sander. The 
figures were then masked with clear contact paper, and their 
outlines were carefully traced with a knife. The mask was 
removed from the figure portion, which was lightly blasted 
(from the front) to delineate the figure from the ground. 
The pieces were then cleaned and eventually adhered to their 
wooden frames with silicon caulking compound. These frames 
were finally inserted into the wooden framework that 
comprises the skeletal compartments within THE WALL.
SCHEDULE 17
SLUMPING TRIALS AND FIRING PROGRAMS
for THE WALL

Figure 1, Middle
Trial 1, Fire 1

Date: 3/13/90

Variables:
- Fired in small kiln #1, 26"w x 26"l x 36"d kiln, very well insulated with soft brick, four tiers of elements
- Temperature maintained with a digital, 4 stage programmable West controller; each stage allows a ramp and dwell cycle
- Wet mold
- Glass used is 1/4" clear float plate glass
- Devitrification Spray A brushed onto glass

Program:* West kiln #1, mold centered on a 20" kiln shelf, hard-brick tripod support

<table>
<thead>
<tr>
<th>Stage #</th>
<th>Program Mode</th>
<th>Temp. Goal F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ramp</td>
<td>928</td>
<td>1 hr 30 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>ABORTED PROGRAM</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Ramp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ramp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ramp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results:
Failure
- Thermal shock shattered glass at 890 F
- too fast a temperature rise
SCHEDULE 18
SLUMPING TRIALS AND FIRING PROGRAMS
for THE WALL

Figure 1, Bottom
Trial 1, Fire 2

Date: 3/17/90
*Denotes new factors or changes

Variables:
- Fired in small kiln #2, 26"w x 26"l x 36"d kiln, very well insulated with soft brick, four tiers of elements
- Temperature maintained with a digital, 4 stage programmable West controller; each stage allows a ramp and dwell cycle
- Wet mold
- Glass used is 1/4" clear float plate glass
- Devitrification Spray A brushed onto glass

Program:* 
West kiln #2, mold centered on a 20" kiln shelf, hard-brick tripod support

<table>
<thead>
<tr>
<th>Stage #</th>
<th>Program Mode</th>
<th>Temp. Goal F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ramp</td>
<td>1022</td>
<td>5 hrs</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1022</td>
<td>15 min</td>
</tr>
<tr>
<td>2</td>
<td>Ramp</td>
<td>1450</td>
<td>1 hr 15 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>ABORTED PROGRAM</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ramp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ramp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results:
Failure

-Glass cracked at 1300 F
- Stone or impurity in glass (?)
SCHEDULE 19

SLUMPING TRIALS AND FIRING PROGRAMS
for THE WALL

Figure 1, Middle
Trial 2, Fire 3

Date: 3/19/90

*Denotes new factors or changes

Variables:
- Fired in small kiln #1, 26"w x 26"l x 36"d kiln, very well insulated with soft brick, four tiers of elements
- Temperature maintained with a digital, 4 stage programmable West controller; each stage allows a ramp and dwell cycle
- Pre-fired mold*
- Glass used is 1/4" clear float plate glass
- Devitrification Spray A brushed onto glass
- Drilled 1/4" air holes in deepest parts of mold*
- Mold placed flat on shelf coated with silica*

Program:
West kiln #1, mold centered on a 20" kiln shelf, hard-brick tripod support

<table>
<thead>
<tr>
<th>Stage #</th>
<th>Program Mode</th>
<th>Temp. Goal F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ramp</td>
<td>1022</td>
<td>7 hrs 30 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1022</td>
<td>15 min</td>
</tr>
<tr>
<td>2</td>
<td>Ramp</td>
<td>1450</td>
<td>1 hr 30 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1450</td>
<td>10 min</td>
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<tr>
<td>3</td>
<td>Ramp</td>
<td>1022</td>
<td>0</td>
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<td></td>
<td>Dwell</td>
<td>1022</td>
<td>6 hrs</td>
</tr>
<tr>
<td>4</td>
<td>Ramp</td>
<td>800</td>
<td>10 hrs</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>800</td>
<td>0</td>
</tr>
</tbody>
</table>

(Wedge vent kiln at 300 F)
Results:
Success*

- Good slump; good detail retention
- Strong yellow/green cast to glass*
SCHEDULE 20

SLUMPING TRIALS AND FIRING PROGRAMS
for THE WALL

Figure 1, Bottom

Trial 2, Fire 4

Date: 3/20/90

*Denotes new factors or changes

Variables:

- Fired in small kiln #2, 26"w x 26"l x 36"d kiln, very well insulated with soft brick, four tiers of elements
- Temperature maintained with a digital, 4 stage programmable West controller; each stage allows a ramp and dwell cycle
- Pre-fired mold with deep cracks*
- Glass used is 1/4" clear float plate glass
- Devitrification Spray A brushed onto glass
- Drilled 1/4" air holes in deepest parts of mold
- Mold placed flat on shelf coated with silica

Program:

West kiln #2, mold centered on a 20" kiln shelf, hard-brick tripod support

<table>
<thead>
<tr>
<th>Stage #</th>
<th>Program Mode</th>
<th>Temp. Goal F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ramp</td>
<td>1022</td>
<td>7 hrs 30 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>ABORTED</td>
<td>PROGRAM</td>
</tr>
<tr>
<td>2</td>
<td>Ramp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ramp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ramp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results:

Failure*

- Large balloon shaped air bubble formed at 600 F; aborted
- Strong yellow/green cast to glass
SCHEDULE 21
SLUMPING TRIALS AND FIRING PROGRAMS
for THE WALL

Figure 2, Middle
Trial 1, Fire 5

(This was the program used successfully for all remaining trials; therefore, I will omit listing the additional schedules for slump firings 6 - 12)

Date: 3/22/90

*Denotes new factors or changes

Variables:
- Fired in small kiln #2, 26"w x 26"l x 36"d kiln, very well insulated with soft brick, four tiers of elements
- Temperature maintained with a digital, 4 stage programmable West controller; each stage allows a ramp and dwell cycle
- Slow fired, wet mold*
- 3" chicken wire imbedded in mold slab
- Glass used is 1/8" clear Bullseye sheet glass, smooth side up
  - cut to 23 1/2" x 16"
- No devitrification Spray A brushed onto glass
- Drilled numerous 1/4" air holes into mold, one in every depression, several along the edge of a drastic relief change
- Mold placed on small soft brick rests distributed beneath mold, placed carefully to avoid obstructing air holes
  - set on double width shelves coated with silica

Program:*  
West kiln #2, mold centered on two kiln shelves placed side by side, hard-brick tripod support*

<table>
<thead>
<tr>
<th>Stage #</th>
<th>Program Mode</th>
<th>Temp. Goal F</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ramp</td>
<td>990</td>
<td>7 hrs</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>990</td>
<td>10 min</td>
</tr>
<tr>
<td>2</td>
<td>Ramp</td>
<td>1325</td>
<td>1 hr 30 min</td>
</tr>
<tr>
<td></td>
<td>Dwell</td>
<td>1325</td>
<td>10 min</td>
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Program (con’t)

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(Wedge vent kiln at 300 F)

Results:

Success*

- Good slump; good detail retention
- Bright, brilliantly clear glass; some ripple texture remaining*
- Some of the deeper molds required a second firing to achieve a complete slump
ILLUSTRATIONS
Fig. 1. *THE WALL*, (front view)
Fig. 2. THE WALL, (side view)
Fig. 3. *THE WALL*, (back view)
Fig. 4. THE WALL, (detail, PANIC figure)
Fig. 5. *THE WALL*, (detail, PANIC head)
Fig. 6. THE WALL, (detail, STRUGGLE figure)
Fig. 7. *THE WALL*, (detail, STRUGGLE head)
Fig. 8. THE WALL, (detail, DEPRESSION figure)
Fig. 9. THE WALL, (detail, DEPRESSION head)
Fig. 10. IN MEMORY OF...
Fig. 11. SILENT SCREAM #1
Fig. 12. SILENT SCREAM #2
Fig. 13. SILENT SCREAM #3
SELECTED BIBLIOGRAPHY


