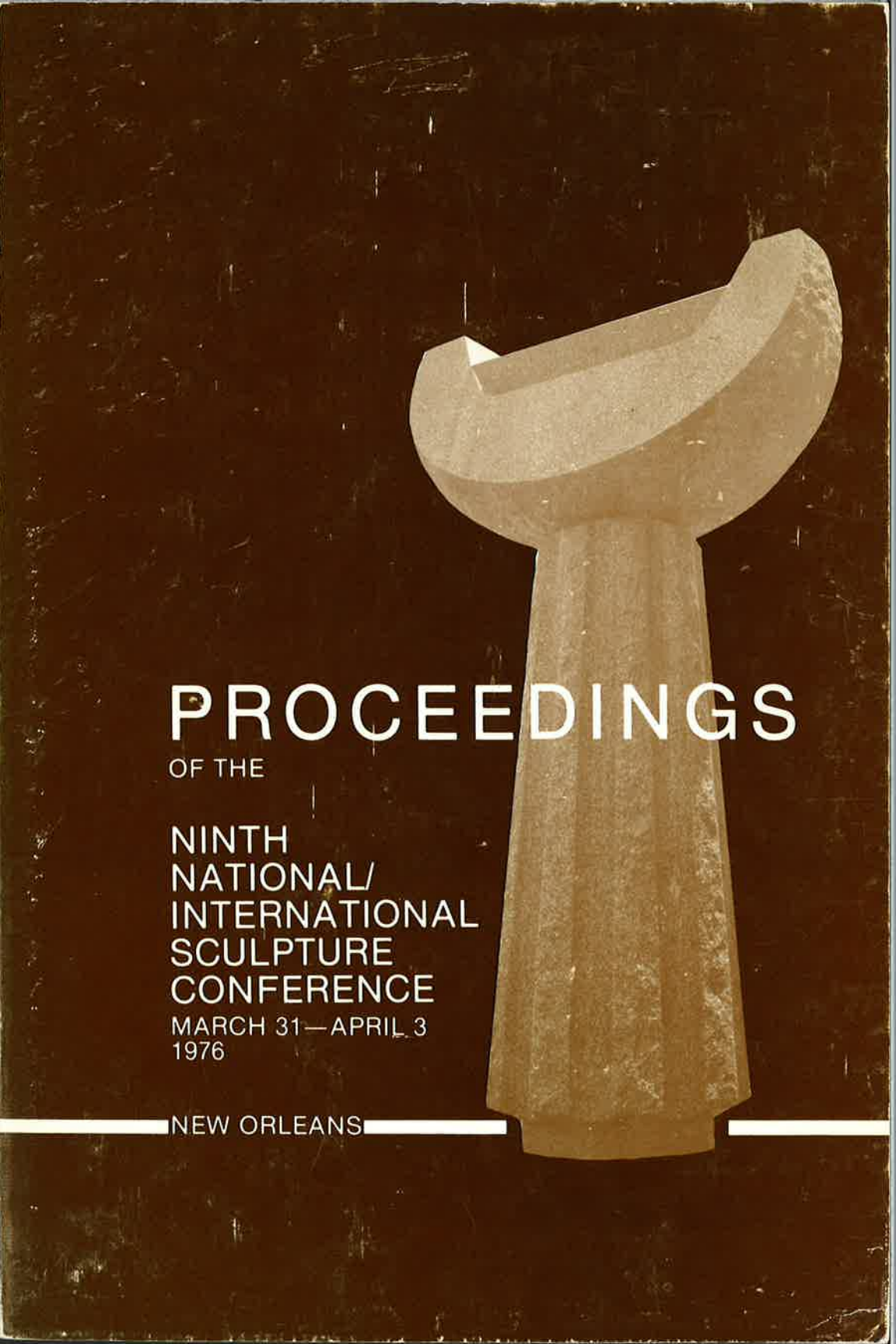

PROCEEDINGS

OF THE

NINTH NATIONAL/ INTERNATIONAL SCULPTURE CONFERENCE

MARCH 31—APRIL 3
1976

NEW ORLEANS

PROCEEDINGS OF THE NINTH NATIONAL/ INTERNATIONAL SCULPTURE CONFERENCE
March 31, April 1, 2, 3, 1976

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INTERNATIONAL SCULPTURE CENTER
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS, 66045

ACKNOWLEDGMENT AND FOREWORD

CONFERENCE

For the second time in its history, the Sculpture Conference has clearly demonstrated its viability, this time, not in the face of calamity, but by the warmth of a delightfully intriguing city. Much credit, however, belongs to the city of New Orleans for its demonstrated ability to not only present some of the most colorful of entertaining events, but exemplary effectiveness in the organization of a cultural event. It is of interest to note that this effort was made not only by the schools, the museum, and other cultural organizations, but by the people, individually and collectively. To reiterate from the opening of the Conference, we owe Lin Emery gratitude for the masterful coordination that sparked and kindled the interest which led to this unique accomplishment for sculpture by the city of New Orleans.

We must mention the foresight of The University of Kansas in co-sponsoring a meeting in New Orleans that traditionally had been held since its inception in 1960 on its own campus. Also, we recognize the special hosting by Tulane University, Xavier University, the University of New Orleans, and the New Orleans Museum of Art.

The initiation of the Ninth Conference was made possible by funds generated by the New Orleans Conference Advisory Board and was further assisted by a grant from the National Endowment for the Arts.

PROCEEDINGS

Participants in multiparticipant presentations were furnished transcriptions of their contributions for editing while solo participants were asked to prepare papers before the Conference or descriptive reports on their contributions after the Conference for publication. We are grateful for the effectiveness of the response and cooperation received.

In finalization of the *Proceedings*, we wish to acknowledge special efforts and thank Janice Hutchison for grammatical editing, Rockne Grauberger for setting cold type, Bruce Smith and Meeko Lewis for graphics, and the many other friends and students whose efforts effected the transcription and assisted the extensive communications necessary for assembly of the material.

Elden C. Tefft, Director
International Sculpture Center

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STONE ON STONE

Kenneth Campbell
New York

My sculpture always has been fundamentally influenced by the original proportions of the stones worked on. This has become a basic philosophy in all of my thinking and creating. I believe the designing of proportions into the shapes of the stones ordered from the quarry has been the most important contribution of stone carving throughout history. This amounts to saying that the proportions of the Greek temples were determined from the beginning by the measures incorporated into the blocks or marble at the quarry.

In making models I try, therefore, to design the proportions into the shapes of the stones ordered from the quarry, and the structural assemblage of these elemental parts becomes a theme in the final work.

Other characteristics of stone carving are derived from the direct use of this three-dimensional reality. The surfaces move into a continuous organic flow and opposition of planes to complement the openness derived from the construction of its elemental parts.

I have a decided preference for carved stone, for here the notion of time is incorporated into its organic development. As it grows the motion of the moving hand pours timely substance into its flowing surfaces and it flows on until its conscious moments arrive at fulfillment. Within each stone there is a promise to be fulfilled. From the beginning there is always a three-dimensional reality. Such is the beauty of its substance, its suchness, its wholeness is always there. Whatever move may come, it changes but gradually, and in so doing a bit of time becomes embedded there for eternity. Think of the time in history that is already there in every grain of this stone.

All art is a revelation of thoughts from other spheres. Always from one whole another whole is made. Nothing ever comes from nothing; something always comes from something. Of such is the suchness, the wholeness, the solidness, the eternity, the history of each piece of stone.

All of these sculptures are arrangements of stone on stone. By so doing they gain extension and proportion from their fabricated juxtaposition.

In some instances where possible, slides are shown of the work in progress, thereby indicating and showing how the thought is often there from the beginning, but awaiting only the flow of time and process to pass through it to a revelation of its fullness on completion.

DAY Kenneth Campbell

For years I have been fascinated by the notion that the great sculptors of the past measured their forms directly on the surfaces of each cubic volume and mass. I am well aware this is a

contradictory statement, for one can easily ask "If they did not know what these finished volumes would be, how could they draw on their surfaces?" It is at such a point that we must begin to understand what was known as the *glyptic* art. This term is a Greek phrase which literally means "to chip away." Carvers have followed this up with the notion that the idea is inside the stone ready to burst its bounds to become manifest in all its pristine state. Much as in the dance of Salome, she drops one veil, and then another veil, until when she has reached, finally, the seventh veil, she stands forth in all her glory. Michelangelo had a favorite saying which was, "Somehow as I chip away the form gets larger." After mulling this over, it was suddenly clear to me that, paradoxically, it really did get larger, in the sense that there was more surface area.

Now, as the hand moves on, it writes with incisiveness the message for ages to come. Miraculously, this becomes the spontaneous act. Where measurement is concerned, there must be a true connection between time, place (or three-dimensional space) and and volume. The real holistic combination of these three elements will reveal, if freely done, the spontaneous act. Its final combination with the element of time will call forth Fates. This timeliness becomes the hand moving on through space.

There is always the basic shape: the something, the suchness from which the work evolves. It may be that a stone is found of some peculiar shape which excites the imagination. Upon dwelling on this, we realize our constant endeavor is to define or categorize the shape of all external forms that meet our outward gaze. We draw them into our very being. We communicate with them and they communicate with us. In this exchange of being, an entity starts to evolve and grow in a veritably organic way. This entity becomes a life in itself, stirring and expanding from the center of the stone. As we turn the stone about, be it large or small (as if it were a pebble in the palm of the hand) even though it may require being pushed or shoved by a tractor or pulled or dragged by a cable, each move reveals a facet, a mode of viewing, that seems new or exciting. One endeavors only to keep the light constantly burning in our intense inner being so that the life of this object, this very wholeness, comes to consciousness. The entire effort is constantly to see, constantly to feel, constantly to do with, this entity. This is the something, the someplace, the somehow, that comes about when at a moment of revelation, and with the shock of recognition, all becomes clear to us. To paraphrase Socrates, we can know only that which we have known already from eternity.

MUSICAL STONE Kenneth Campbell

The process of creation is above all a process. One may reap only as one sows from the innocence of the heart. The effort is to keep constantly in touch with an inner being which is nothing if it is not miraculous. The world about us is a miraculous place. Wonders will never cease if we will but allow that still small voice to speak from within. This is true sensitivity, the purest form of intelligence. The true way is but to allow this intelligence to grow. Where the ground has been cultivated, intuitive intelligence may grow. What the sensibility receives, the creative impulse draws forth from within. We define these events with the movement of the hand, chisel, and hammer. Somehow, as the chips fall off, we must seem to add, to increase, to expand the forces from the center of the stone. There is a crisis of identity when we feel in, or of, the stone. Perhaps it is in the breath we breathe in, perhaps in the thought we breathe out. Some force other than ours has captured our very being and must speak through us. All such things come about in the constant flow of creation. To keep alive the message from the infinite, as William Blake said, "If our eyes were truly cleared, we would see all things as they really are: Infinite."

The artist-sculptor must lay out before himself the reality of his day and age. Surely for our changing times, when events move faster and faster each coming year, the novelties of each day will last but for a very short time. We must tap the infinite, for art is mostly about eternity. All other great ages of civilizations of any note have had their artists or sculptors who preserve a semblance of monumental memory of the day that has passed away. Yet, in every town and county of this land of ours, the most conspicuous sights are the monumental piles of used-up junk, signs and symbols of a total pollution that each day becomes more totally polluted. The impasse has come. The new Age is well on its way.

This generation has a much stronger message than any generation before it. It is a spiritual message. I must confess that the constant fluctuation to first one material then to another by sculptors today completely bores me. In my mind this seems to be an indication of our materialistic age as a means of evading aesthetic commitment and development of a spiritual message or simply an inability to convey a thought in some sensible manner.

.PYRAMUS AND THISBE
Kenneth Campbell

ARTIFICIAL INTELLIGENCE MACHINES AS SCULPTURE

Kurt F. Lauckner
Michigan

INTELLIGENT SYSTEMS

The essence of man is intelligence! This rather provocative statement sums up a very good reason why the arts have been concerned with exploring intelligence, although examination of these efforts at this point seems to indicate that the real exploration is about to begin. It is the advent of the digital computer which will make "seemingly intelligent" systems possible. Before making this survey, it will be helpful to gain some understanding of the field of endeavor, labeled "artificial intelligence." The following paragraphs represent a short introduction to the subject.

It seems quite fitting in this survey to examine the differences between the human brain and the computer. After all, our only example of superior intelligence is human life. Several years ago E.C. Shannon of M.I.T. made the following interesting comparisons:[1]

1. Differences in size. Six orders of magnitude in the number of components takes us so far from our ordinary experience as to make extrapolation of function next to meaningless.
2. Differences in structural organization. The apparently random local structure of nerve networks is vastly different from the precise wiring of artificial automata, where a single wrong connection may cause malfunctioning. The brain somehow is designed so that overall functioning does not depend on the exact structure in the small.
3. Differences in reliability organization. The brain can operate reliably for decades without really serious malfunctioning (comparable to the meaningless gibberish produced by a computer in trouble conditions), even though the components are probably individually no more reliable than those used in computers.
4. Differences in logical organization. The differences here seem so great as to defy enumeration The brain is largely self-organizing. It can adapt to an enormous variety of situations tolerably well. It has remarkable memory classification and access features, the ability to rapidly locate stored data via numerous "coordinate systems." It can set up stable servosystems involving complex relations between its sensory inputs and motor outputs, with great facility. In contrast, our digital computers look like idiot savants. For long chains of arithmetic operations a digital computer runs circles around the best humans. When we try to program computers for other activities their entire organization seems clumsy and inappropriate.
5. Differences in input-output equipment. The brain is equipped with beautifully designed input organs, particularly the ear and the eye, for sensing the state of its environment. Our best artificial counterparts, such as Shepard's Analyzing Reader for recognizing and transcribing type and the "Audrey" speech recognition system, which can recognize the speech sounds for the ten digits, seem pathetic by comparison. On the output end, the brain controls hundreds of muscles and glands. The two arms and hands have some sixty independent degrees of freedom. Compare this with the manipulative ability of the digitally controlled milling machine developed at M.I.T., which can move its work in but three coordinates.

> Most of our computers, indeed, have no significant sensory or manipulative contact with the real world but operate only in an abstract environment of numbers and operations on numbers.

As is quite understandable, most humans tend to visualize other intelligent forms as looking like themselves. This is probably why concerns about intelligence have for some time taken the form of robots. Of course, robots are definitely important to our industrialized society (e.g., robots on factory assembly lines), but they only superficially represent the field of artificial intelligence. For this reason a discussion of robots will not be part of this tutorial.

At this point some type of definition of artificial intelligence is most appropriate. Jackson[2] states:

> " 'Artificial intelligence' is the ability of machines to do things that people would say require intelligence. Artificial intelligence (AI) research is an attempt to discover and describe aspects of human intelligence that can be simulated by machines."

But, this may seem to some readers to be a rather ambiguous definition. To those people maybe a working definition as offered by Turing's test is more appropriate. This test is an experiment on the object or system which is claimed to have intelligence. A human interrogator is told that he/she will be communicating thru a typewriter-like terminal with two different entities: a computer and another human. But, the interrogator will not know which one is responding, because an experimentor randomly switches between them. If the interrogator can distinguish between them with better than 50 percent accuracy. then the machine is said to be intelligent.

This may seem like a rather good test, but one example, which shows how easily humans can be fooled, is the program written by Weizenbaum to carry on a conversation with humans in much the same way as do psychotherapists (Rogerians). The program entitled "DOCTOR" is best illustrated by showing the typical conversation[3] below, where the capital letters are from the computer and the small type is the human.

Men are all alike.
IN WHAT WAY?
They're always bugging us about something or other.
CAN YOU THINK OF A SPECIFIC EXAMPLE?
Well, my boyfriend made me come here.
YOUR BOYFRIEND MADE YOU COME HERE?
He says I'm depressed much of the time.
I AM SORRY TO HEAR YOU ARE DEPRESSED.
It's true. I am unhappy.
DO YOU THINK COMING HERE WILL HELP YOU NOT TO BE UNHAPPY?
I need some help, that much seems certain.
WHAT WOULD IT MEAN TO YOU IF YOU GOT SOME HELP?
Perhaps I could learn to get along with my mother.
TELL ME MORE ABOUT YOUR FAMILY.
My mother takes care of me.
WHO ELSE IN YOUR FAMILY TAKES CARE OF YOU?
My father.
YOUR FATHER?
WHAT RESEMBLANCE DO YOU SEE?
You are not very aggressive, but I think you don't want me to notice that.
WHAT MAKES YOU THINK I AM NOT VERY AGGRESSIVE?
You don't argue with me.
WHY DO YOU THINK I DON'T ARGUE WITH YOU?

You are afraid of me.
DOES IT PLEASE YOU TO BELIEVE I AM AFRAID OF YOU?
My father is afraid of everybody.
WHAT ELSE COMES TO MIND WHEN YOU THINK OF YOUR FATHER?
Bullies.
DOES THAT HAVE ANYTHING TO DO WITH THE FACT THAT YOUR BOYFRIEND MADE YOU COME HERE?

In putting "DOCTOR" in its proper place as a non-intelligent system, Weizenbaum[3] states:

> It is said that to explain is to explain away. This maxim is nowhere so well fulfilled as in the area of computer programming and artificial intelligence. For in those realms machines are made to behave in wondrous ways, often sufficient to dazzle even the most experienced observer. But once a particular program is unmasked, once its inner workings are explained induce understanding, its magic crumbles away; it stands revealed as a mere collection of procedures, each quite comprehensible. The observer says to himself, "I could have written that." With that thought, he moves the program in question from the shelf marked "intelligent," to that reserved for curios, fit to be discussed only with people less enlightened than he.

Heuristic programming, mentioned in the above quote, is so often associated with the field of artificial intelligence that it is necessary to briefly describe what it means. A *heuristic* is a strategy or approach which does not have a complete set of rules governing actions. Instead, "rules of thumb" are used to make decisions. An analogy might be the decision-making rules that a fellow uses in deciding whether or not to ask a girl for a date. Normally, he doesn't have a checklist but instead follows his intuition, whatever that is. Most human decision-making is of this nature, that is, heuristic in nature. Heuristic programming is similar; the programs do not take into account all possible alternatives, but, instead, have a few general guidelines on which to base decision. Computers using heuristic programs certianly are not infallible; but, how many humans are?

Another aspect of artificial intelligence involves learning systems. These are systems which can change themselves based on some learning situation. There are many examples of these types of systems; one in particular, involves the game of NIM. This game consists of three piles of sticks with 1, 2, and 3 in each pile, respectively. The game has two players each trying to make the other take the last stick. The rules state that you may take as many sticks as you wish from any single pile, but at each turn, a player must take at least one stick. Computer programs have been written to play NIM against a human player. Each game's results are recorded in the "memory" of the program so that when a choice must be made, the computer chooses the path which led to the most wins.

Finally, it should be noted that serious research efforts in artificial intelligence are not aimed at creating universal robots that walk, talk, see, and listen. Instead, each of these attributes are generally pursued individually. The major areas of artificial intelligence currently involve: (1) game playing (checkers, chess, "Go"); (2) pattern recognition (scene analysis, speech understanding); (3) problem solving; and (4) theorem proving.

CLASSIFICATIONS OF INTELLIGENT SCULPTURE

It is convenient to categorize artistic works as to their sophistication, or better yet, their "intelligence". Two

major categories immediately evident are works which exhibit "reflected intelligence" and those with "internal intelligence". The reflectively intelligent system accepts intelligent inputs to that sculpture, such as movement, temperature, light shadows, and sound, and then it "reflects" them back to the viewer in the form of sound, movement, etc. This type of sculpture does not make sophisticated decisions. The internally intelligent system, as one might guess, does indeed make intelligent decisions and "thinks", whatever that means!

REFLECTIVELY INTELLIGENT SCULPTURE

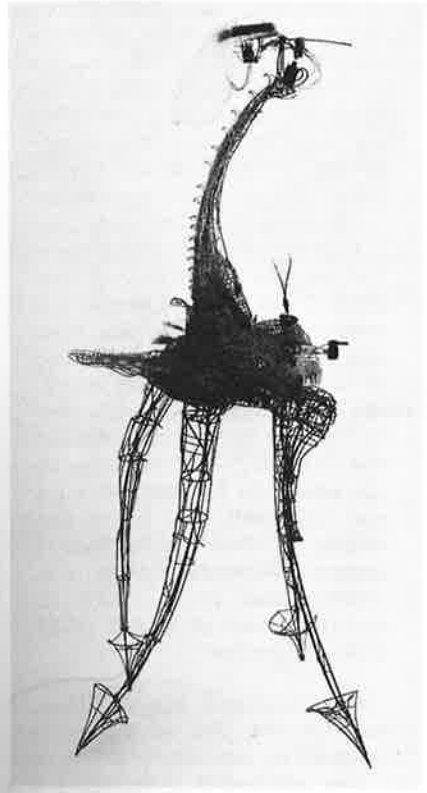
The preceding brief summary should be sufficient background to examine and to understand the following remarks made about the efforts of various artists in the area of "intelligence sculpture." First, we will examine those works that can be categorized as reflectively intelligent.

Tsai Wen-ying started a series of sculptures in 1966, which are described as "Cybenetic Sculptures." He took information from the environment, such as sound and physical proximity of the spectator, to control the actions of the sculptures. This particular series consisted of vibrating stainless steel rods whose rate of vibration varied with the sound and spectator presence. Illuminating the sculpture was an ever-present stroboscopic light, which makes each piece seem to oscillate asymmetrically. If the strobe-flash frequency matched that of the vibrating rods, then they seemed to remain stationary. The overall effect is to produce a dynamic and exciting "presence."

One of Nicolas Schoffer's unusual, intelligently reflective sculptures, CYSP I (1956), was sensitive to changes in light and sound. It could seemingly interact with the environment, and was, in fact, used in a ballet with electronic music. The mobile sculpture moved about on motorized wheels, responding to light and noise. It is of the reflective-type intelligent sculpture because there is no intelligence internal to the sculpture itself. Rather, it was the dancers' intelligent shining of light and the presence of "intelligent noise," which seemed to give the sculpture "life."

One of the more complex and involved sculptures of the reflectively intelligent type is the Electronic Peristyle (1968) created by James Seawright. As part of the Magic Theater Show in Kansas City, it is truly enveloping. As quoted from the *Magic Theater Catalog* by R. T. Coe:

> Here the viewer passes into the symbolic "control center" of the theater, into an environment in the form of a circle 18 feet in diameter surrounded by columns 7 feet high facing into a central control unit. The overall diameter of the piece, including entrance ramps which lead to the slightly elevated interior floor is 21 feet. Each outer column, faced with black formica, contains an audio power amplifier and speaker, a recess containing a structure of lamps, various indicator lamps, a ventilation fan with its exhaust duct facing into the circle, and miscellaneous control circuits. Here, as elsewhere in the voyage, dark Ozite carpet is used to quiet.
>
> The central control unit, a shaft and acrylic globe, contains a system of digital circuitry, an electric sound-generating system, a circularly scanning photo-detector (set atop the globe), 12 lamp-photo-cell-beam links with each column, power supplies, and other control devices. The lamp-photo-cell-beam links divide the interior space of the circle in such a way that movements of viewers must necessarily break the beams and produce an input of data which is processed by the piece, according to the way in which it is programed, and according to the record of previous activity giving rise to sound and light phenomena which are perceived by the viewer.



BLUE WAZOO Kurt Lauckner

Jim Pallas has many sculptures that come under the category of reflectively intelligent sculpture. One in particular, the *Blue Wazoo* (1977), responds to both light and sound. The movement of people affecting the light that strikes the *Blue Wazoo* and the sound of human voices cause a fan to inflate a plastic bag (head). Also, various twitches and blinking lights seem to indicate some intelligent-type presence.

Many other examples of sculptures in this category exist. But, this commentary will close with the one by Edward Shnatowicz called *The Senster* (1971). This quite large (15 feet long by 8 feet high) structure has six independent servo-systems based on the articulation of a lobster's claw. Its four sensitive microphones (located in the "head"), enable Senster to compute the direction of a sound, and its close-range radar device detects movement of spectors. A description of *Senster* in operation from Jonathan Benthall's book[4] states: "The head moves swiftly towards any source of quiet motion, as though hunting for food. But if the motion becomes violent—say, a spectator tries to strike out at the claw; or if the amplitude of sound rises; one person is monopolizing attention by shouting at it—the head will shy away as though frightened."

In this last sculpture the computer control could be modified to more than reflect the spectator's intelligent movements and sounds. In fact, "Shantowicz hopes that new computer programmes will be developed so that the *Senster* will 'learn' new behaviors. If this is done, *Senster* will then be a candidate for the next category of intelligent sculpture.

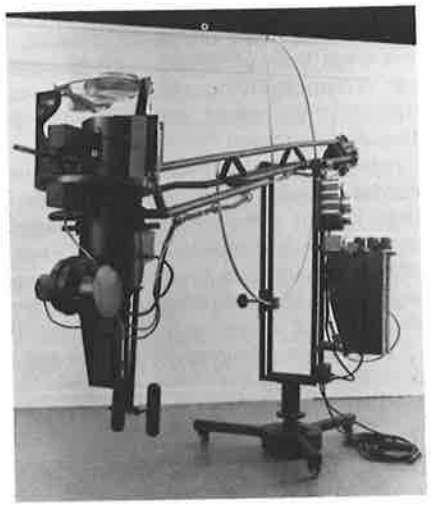
INTERNALLY INTELLIGENT SCULPTURE

Internally intelligent sculpture has some means for making "intelligent decisions," whatever that means. Most of the sculptures discussed derive their intelligence from humans, or in other words, humans are part of the sculpture itself.

The first example of intelligent sculptures to be discussed here is Nam June Paik's *Robot K-456* (1965). This particular piece is 6 feet high and has 20 channels of radio control. *Robot K-456* would amble down the sidewalk under the control of an unseen operator; it would confront various pedestrians and perform unusual antics, such as "spinning a breast." The human controller is part of the sculpture; the controller's eyes were the input to the total system. The sculpture really has the intelligence of the operator.

Another "human intelligence" based system is *O.C.L.E.S.* (Observer

Controlled Light Emission System) (1975) by William Uphoff. This light projection system is operated by five people simultaneously, each person having 19 controls which govern one optical system. Four of the participants become a part of the sculpture as seen by a fifth person. The intelligence of the four makes itself known through both light and sound, as each participant wears a pair of headphones.



O.C.L.E.S. William Uphoff

Getting away from human intelligence and substituting animal intelligence was a sculpture entitled *SEEK* (1970) by Nicholas Negroponte shown in *Software* at the Jewish Museum in New York (1970). It is best described by the following from Negroponte's description:

> *SEEK* consisted of a simple block-piling mechanism with five hundred two-inch cubes it could pile on a grid within a large glass box. Prior to opening night it did just that, using a simple space-allocation algorithm to assure many nooks and crannies, of course, and remembering the position of each block. On opening night a small colony of gerbils was introduced into the system. Scurrying about within this parsimonious architecture, they knocked over blocks and set many askew, causing a dreadful mismatch between the real world and the computer's model of it. *SEEK's* task was precisely to manage this mismatch, which it did in two ways. In the case of slightly displaced cubes, the machine fastidiously realigned and restored the neighborhood. In the event of major dislocations, the program interpreted the movement as purposeful (i.e., the gerbils wanted it that way) and put the blocks in their new places. For the observer this meant a new architecture, from day to day, changing according to how the little animals inhabited it. The purpose was neither to find the essence of gerbilness nor to liken people to gerbils or the blocks to foreign policy (as was suggested). The intent was simply to show an interactive system observably dealing with unpredictable events, from an unsettled heap of blocks to its own malfunctions.

Jack Burnham[6] saw *SEEK* as a model for the idea of making art: "Art could be rearranging blocks over and over again—just as sculpture is a matter of arranging forms infinitely. New aesthetics constantly force new arrangements in the same sense that the gerbils force the computer to model new possible environments."

Finally, one of the most controversial and most intelligent systems to date is the Harold Cohen work. He has written a program which "creates" drawings. It must be strongly emphasized that the program does not use an artistic alphabet, but rather it creates each symbol and decides each placement. The work got its original impetus from Cohen's observation of the Southwestern Indian petroglyphs: whoever made these symbols was trying to say something. They're evocative! In creating his drawing program, Cohen was

mainly interested in creating evocative drawings. His program truly makes intelligent decisions and creates.

DRAWING Harold Cohen

FOOTNOTES

1. Claude E. Shannon, "The Brain and the Computer," *The Compleat Computer*, Van Tassel, S.R.A., 1976, p. 22.

2. Jackson, Philip C., *Introduction to Artificial Intelligence,* Petrocelli Books, 1974, p. 1.

3. Weizenbaum, J., "ELIZA—A Computer Program for the Study of Natural Language Communications Between Man and Machine," *Communications of the A.C.M.*, Vol. 9, No. 1, Jan. 1966, pg. 36-45.

4. Benthall, Jonathan, *Science and Technology in Art Today*, Prueger, p. 83.

5. Burnham, Jack, *Beyond Modern Sculpture*.

MONUMENTAL WATER SCULPTURE

Oliver Andrews
California

I should like to begin by showing a ten minute film on the water sculptures executed by Isamu Noguchi for the World's Fair at Osaka in 1970. Mr. Noguchi is here at the Conference. You can see another water sculpture of his, this one in granite, in front of the Federal Building in downtown New Orleans. Noguchi has worked with water in a number of projects, but by far the most ambitious and technically complex to date, is his group of seven pieces at the Osaka Expo.

The sculptures are situated in a long rectangular lagoon which besects the fairgrounds. The tallest is one hundred feet high with powerful jets streaming down into the water below. There is an equipment vault under the lagoon full of motors, valves, timers, and switches. Noguchi worked with the representatives of a number of Japanese industries on the equipment for this project.

This one is a favorite of mine. It is a tall, blue cylindrical column pierced with hundreds of small holes. You are seeing the column as it is filled with water which is forced out of the holes in a fine spray, creating a pillar of mist.

All of the sculptures are programmed in several different cycles. These two domes, or mushroom-shaped sculptures, rise up out of the lagoon, spout water from various orifices, rotate, then submerge again.

Another disk sprays water from a stationary position, then rotates, leaving fan-shaped water patterns in the air.

Here is a smaller cube-shaped sculpture which sprays jets of water down into the lagoon. In the background is a series of columns with spiraling patterns of water rotating from the top down. In addition to the seven painted metal sculptures, there are three whirlpools formed by disks beneath the surface.

Now we see the same sculptures at night illuminated from above and from below by submerged lighting units. This whirlpool is especially beautiful at night when the underwater light pattern reinforces the swirling funnel of water, making it look like a luminous wet galaxie. Here, Noguchi has succeeded in creating a sculpture of almost pure energy.

Unlike the pavilions, the lagoon with Noguchi's sculptures was not removed when the Fair was over. I understand they are all in operating condition and are turned on from time to time for special civic events. Now I should like to show you a few slides of traditional water sculpture and some more water sculpture by contemporary artists.

This is a grand classical type of fountain in Madrid. It is the kind of sculpture found in the center of a city that is made to be an example of civic pride. These things used to be driven by water power from rivers, but now they use hydraulic pumps and electric lights.

This is at a large waterworks at the Villa Reale in Caserta, Italy. It is an example of the kind of water sculpture that was built throughout Western Europe for villas and palaces. The cascades are combined with smaller, quieter water devices such as these basins and pools.

This is a classical type of water piece which has a large level basin so that water flows evenly off the edge. Nice moss grows there.

This is the famous Trevi Fountain, a good example of an 18th century fountain in Rome. It is an example of using water that comes to the city. Most cities were built on streams and everything possible was done with the water before it ran out of town. It was used for drinking, for washing, for industrial purposes and, of course, it was used for the fountain, the symbol

of the community's pride in the city.

This is the famous Villa D'Este in Tivoli outside Rome. It was designed about the middle of the 16th century. The designer, Piero Ligorio, was supposed to have said it would take at least one hundred years for it to become really good, for the planting to mature properly. Today it is run by hydraulic pumps. Originally it was powered by a river which ran down a mountain and was diverted to this place. You see a tremendous amount of hydraulic pressure which provides a lot of excitement in this place.

This is a little grotto behind one of the waterfalls. The Villa D'Este is an almost encyclopedic display of different kinds of water effects. Water is running through plants, over little parapets and cliffs, in troughs, and trickling, doing just about everything that water can do.

This is one of the grottos underneath the main waterworks. There are alcoves where the water is pumped very forcefully against a flat surface so that it is spread out into a sheet. These little jets of water are sparkling in small intimate green places. At the end of the garden is a place where the water is very quiet and peaceful after all the roar, power, and excitement in the upper garden.

The tradition of using water quietly is found in Spain, in the Southern Mediterranean, in the islands of the Mediterranean, and particularly in North Africa.

In southern Spain, Granada for instance, there is the tradition of water use which came from North Africa with the Moors. Water is not used in a grand display since it is something very precious. In the desert, water is a matter of life and death and is used in a different way, in quiet sheets and small, cool trickles. These flat sheets of water in shallow pools are a perfect foil for the kind of architecture which has intricate tiles and very small-scale pierced screens that reflect beautifully in the sheets of water.

The Moorish tradition further to the east is shown here in a small garden on the island of Rhodes.

In Japan water is used more quietly than in the grand spouting tradition of Versailles or of Bernini in Rome. This is a small garden in a villa outside Kyoto called the Shisendo. Raked sand and beautifully pruned bushes are incorporated with the little stream which runs quietly between carefully-formed banks. The stream meanders in a curvilinear pattern through the garden rather than being laid out in the grand perspective-type waterway, such as at Villa Reale in Caserta.

Shimuzu, a contemporary Japanese water sculptor who is sponsored by a shipyard, works among ships undergoing construction. He builds floating sculptures which operate like the traditional Japanese bamboo water-knocker which fills up and swings down to hit a rock, frightening crows and foxes away from the garden. This is a steel version of the same thing.

This is a piece in California at the Fresno Mall by George Tsutakawa, a Seattle water sculptor.

This is a sculpture in San Francisco by Justin De Villancourt. It is a large urban piece made of rough cast concrete located near the intersection of the freeways. It has a steam system which, for quite a while, was out of commission. I understand that it is now back in operation.

This is Jack Zajack from California who works also in Rome and is influenced by Roman use of water. This is white marble with water running over it. It is not a water sculpture but is a sculpture of a wave, a spin-off from an interest in water, where the sculptor tries to sculpt the water itself.

This is a piece by the Baschet brothers, Fernand and Francois, who make sound sculptures. Many of their pieces are stroked or struck with little mallets. This particular one is in the Expo at San Antonio, Texas, and it makes sounds when the water runs through it.

This is a Calder and it is the only Calder water sculpture of which I know. It was installed originally at the Los Angeles County Museum with jets of water striking it, a force which caused the piece to spin around.

It is the sad fate of much water sculpture that after it has been running for awhile, it is found to be difficult, a nuisance, expensive, or hard to clean. Many water sculptures have met the fate of having their water turned off and their pools filled in. This piece now is simply a Calder mobile sitting on the grass and is no longer struck by jets of water.

Here is one which is not actually a water sculpture in the sense that any water comes out of it. It is by Mike Todd and relates to water in the sense that it is specifically designed to be in a reflective pool.

Again, this is not exactly a water sculpture. It is by Charles Perry and is located in the Hyatt Regency in San Francisco. The water aspect of it is the base in which the sculpture sits. It is a large tray with a carefully formed edge from which a very thin but constant sheet of water falls down into a trough.

Notice the design of the corner. The corner is slightly dipped so that the two sheets meet at the edge without forming a spout, which would ruin the sheet. The plastic-coated steel gives it the appearance of a big dishpan it seems to me.

This sculpture is of the same design, but done in black granite. The hydraulic engineering was done by a firm in Oakland, Baemer-Wilkinson, which has designed the engineering for a large number of water installations throughout the United States and the world. It is just a square pond with a welling up in the middle from a very large orifice. Then it flows over forming a veil at the sides. Here again you see the corner. Notice how beautifully the water works over the black granite. Unfortunately, this beautiful piece of sculpture which is in front of the Bank of America on California Street in San Francisco, now is filled with earth and planted in geraniums.

Now, some standard water sculpture. This is a type of water sculpture that you see often in installations in front of public buildings. The effect is produced by squirting the water against a flat disk on the end of each arm. It looks like a big water dandelion. These sculptures look nice but the wind tends to blow them all over. Wherever you have small orifices in water sculpture, it is very difficult to keep them unclogged and working over any period of time.

Here is the kitsch side of water sculpture in an installation at a motel outside Palo Alto. One can buy these—Venuses and Victories—from catalogs, and the fountain equipment also. The fountains found in catalogs all seem to be in the "spouting-up" tradition that started in Western Europe in the 17th and 18th centuries.

This is an example of a traditional kind of water sculpture which, however, works in a very marvelous way and is in a fantastically beautiful setting. It sits in the Butchart Gardens outside Victoria, British Columbia. The original owner was a man who manufactured cement and excavated a large ravine, then planted the entire place and made it into a beautiful garden. This fountain is programmed and is about forty to sixty feet high depending upon its movement.

A whimsical sculpture by Jacques Overhoff is seen in a park in Seattle where the Expo took place. There are a large number of garden sprinklers which are programmed to turn on and off and to spin at different rates. The work is ingeniously programmed so that there is a long cycle of its many movements.

A water sculpture made of sinks and bathtubs. This is pretty amusing, too! This was seen at the fair in Spokane, Washington, last year. It is just an irrigation pipe in a field and is a very beautiful thing, I believe.

Here is another non-art waterwork. This is the viaduct which runs down through the Central Valley of California in a long sheet of quiet flat water. Moving through that flat land,

This is a work by Lawrence Halprin who has done some interesting water pieces. He has two in Portland, Oregon. In the photo the water is off. Before it turns on, people come and wait for it. When the water is lying quietly in pools like this, it is a very restful place. Finally the water comes welling up and it is wonderful to be there just at the moment the water turns on because it comes rolling down the steps and fills the whole place with a lot of splash and activity. It remains on for about half of the day.

Now I should like to show you some of my own waterwork. Done about ten years ago, these are two pieces, one of copper and one of white marble. As you see, I somewhat prefer this type of water sculpture which is a little quieter, more even flowing, more contemplative than the gushy kind.

This is a small reflective pool in front of a Neutra House in Los Angeles. It is black marble and bronze. Since the water here is actually only a couple of inches deep over gravel, I made wells beneath the surface to contain the pumps and the lights.

This is a piece at a playground at UCLA where one of the conditions was that the pool in which the sculpture was placed would be filled with children. Therefore, it had to be something on which nobody could get hurt. I thought of making something very round with a tree-bark-like surface which would have interest but not have any sharp edges.

People like it! It is cast bronze with a light in the top. The light will prevent someone from climbing on the top and jumping in.

These are two water sculptures in another Neutra House, this one in Santa Barbara. They are stainless steel and copper. This is at the University of California at Riverside. The diamond-shaped piece is Inconel, which is a chrome-iron alloy, rather like a high stainless.

The water is pumped against the back of the diamond-shaped sheet, directed against it, and then flows out just as the water did in that little grotto at the Villa D'Este. It then strikes those return bars at the top and covers the sheet with water. It is hard to make water flow evenly over something of that shape.

These are some smaller pieces, non-monumental pieces that I also make. They have self-contained bases with little pumps in them and water reservoirs. This is a piece of laminated acrylic. Illuminating water sculpture is always a challenge. In this case I wanted to incorporate the light within the water sculpture. One day I was standing outside a motel in the rain, looking at neon going all over the motel and it occurred to me that neon can be in the water. I put the neon tube inside the sculpture and had the water flow over it.

Here is the story of a large monumental water sculpture, from start to finish. It is for the *Los Angeles Times* Newspaper Factory in Costa Mesa, near Los Angeles. The piece is 24-feet high, fabricated of ten-gauge stainless steel. You can see the braces at the base which help to make it rigid. The whole inside is reinforced with bars and then the surface is sanded with a flapwheel by hand so that it has a certain amount of organic wiggle to it.

In the meantime the pool and the equipment vault are being excavated at the site. The rebars are set in place and the pipes are coming in from the vault which is a little ways off, about forty feet away from the pool itself.

Then the piece is picked up on a truck and comes to the site at the same time as the other truck comes with the crane and nylon slings. It looks like a fantastic thing to me, but it is all in a day's work for the crane operators. They lift the sculpture up in the air up over the top of the building. You can see from that flag over there how hard the wind blows in this place! That was one of the factors in the design of this piece.

Down it comes through the hole in the roof, and of course, at this time I am just hoping that the bolts in the concrete are in the same place that I have the holes in the base plate. And so down it continues. It is bolted and leveled, and then the pool is filled and the pump turned on. There it is! This piece does have a wind control on it, so that if the wind blows too hard, it will shut down a little bit and finally it will shut off completely.

The nature of the surface, being not exactly polished but directionally sanded, plus the fact that the lip of the fountain is very rounded, keeps the water stuck to the surface. A sharp lip tends to make the water separate, which makes it easier for wind to blow it off. Keep it flowing smoothly over the lip, then it will stay on the surface of the sculpture even in a considerable wind. But, of course, the time always comes when enough wind will blow the water off of anything.

A nice thing about the stainless surface is that it is very reflective to the atmosphere and the time of day. The sculpture, oriented east and west, has a rosy glow in the morning, looks cool steely blue at noon, and becomes warm orange later in the day.

In the pool there is a level sensor which automatically operates a filling valve and adds more water to the pool when the level goes down.

Destined for Cincinnati, Ohio, here is another piece which we are fabricating. The two units of the sculpture are of quarter-inch thick stainless steel. They were not crated but chained to the bed of a truck. I liked thinking of this truck with these two sculptures on it, motoring across the United States, and wondering what people would think of the mobile sculpture that they were seeing.

Finally the truck arrived. We had waited since 7:00 a.m. with our crane and crew at $100 per hour. It turned out that the time-line is just outside the city of Cincinnati, so the truck driver thought it was an hour earlier. But they had arrived and we assembled the sculpture.

In this case the piping was already in the pool and so these pieces have bottoms on them which are sealed to the bottom of the pool and then there is a hole, which you can see, where the piping comes in to the sculpture. As the concrete was already poured before the sculptures were designed, we drilled and set anchors for the bolts rather than casting the bolts into the concrete.

Notice that the column is square on one edge but the other edges are slightly curved. Aesthetically, I like this because it keeps the shape from being too geometric and hard. It also puts a curvature into the sheet of stainless which stiffens it so that it does not get ripples in it, a result in any welded sheet of stainless which is flat. In this case the shrinkage from the welding goes into the preset curve resulting in a nice, even and smooth skin. It is put under tension before it is welded.

This is the piece at night. Since the front of the building is white marble, it makes a beautiful screen for the water reflections bouncing off the sculpture.

This is another double piece in Racine, Wisconsin. Sometimes you get to put a sculpture in a pool which exists; sometimes the pool can be designed to fit the sculpture. In this case the pool had been there for a long time. I was to make the sculpture and put it in and then we would fill the pool.

I thought it might be a good idea to try out the pool before we put the sculptures in it. Thus the pool was filled with water which almost immediately disappeared. The merchants on each side of the street began to report that their basements were filling up with water. So we poured a liner, we poured another pool inside the old pool, and then everything was O.K.

This has a bronze base which is cast bronze, a sort of ramp which the water flows down. The sheet was something I wanted to try slightly slanted. The water sticks to the underside because of the attraction of the

surface to the water. One can see how the water runs down the undersurface. It seems to hang there upside down.

Rather than being in a pool, this piece has a self-contained water supply. The sculpture is made of titanium, which as you know, is extraordinarily durable and does not rust as stainlesses do after a while; it is heliarc welded, not an easy job. Because titanium cracks so easily, you have to work out a sequence so that the shrinkage and expansion take place in a way that can be accommodated by the metal. In the top there is a little screen so that when people throw pennies into it from the balcony above, the coins will not be sucked into the pump.

This is a piece in the Menlo Clinic, Menlo Park, California. It is all welded bronze sheet, 20 feet high by 4 feet wide. The sides are textured with welds. It is welded with a short-arc welder, with 64 passes on each side of the sculpture and then they are ground down slightly. The weld lines were drawn by hand so that they are not exactly straight. I drew the lines and the welder followed them very closely, but he did not like the fact that the lines were not drawn with a straight-edge. In fabrication, this is a hard thing to get anybody to do too, because a good workman thinks that he should make everything perfect. Any deviation from what a workman thinks is perfection has to be very carefully described.

This is a piece in the crypt of a cemetery. I was interested in this project because I felt that some of the greatest sculpture of the past has been associated with the idea of death and how to memorialize it; what to do about it. That great tradition has become sorry and depleted in our time, so I wanted to try something which would deal with this idea in a simple and direct way.

There are two sarcophagus-like bronze water containers and the sculpture each standing in water. The horizontal sculpture has a curve in which the water wells up in a way that I think of as a kind of life-giving swelling of the water.

Also, it was interesting to me to make the water flow over a curve. I talked to some engineers about making the water do this, and they said, "You fool, don't you realize that water is level? You can't make water flow over a curve." But, by putting baffles on the edges (it looks like a pipe organ inside with controlled water jets) you get an even flow over the whole length of that curve.

PRISM Oliver Andrews

This is the latest project that I have been working on. It is in a shopping center called El Paseo de Saratoga in San Jose, California, in which the architect and I worked for quite a while designing a water system into the whole concept of the shopping center. This is really the way to work if you can get into that situation—one where you can start designing from the very beginning.

We designed a continuous waterway all through the shopping center, and in various places there are sculptures.

Here is another piece with a curved lip. The center is higher than the ends and the water is again pumped through baffles so that it comes evenly over the edge. And in this one, rather than having the water stay on the surface all the way, I had it dropping off the edge in a sheet. The tricky part of this one is the corners. You see, if you just made that as a simple shape, the water would not run out to the point of the corners. The slots and baffles bring the water out to the corners.

WATERBLADE Oliver Andrews

The pieces are made in two ways. Sometimes the smaller ones are completely hollow thus they fill up from the bottom all the way to the top. The larger ones have a trough at the top so that you will not have the weight of water filling the whole sculpture. Depending upon the size and the thickness of the walls, sometimes there are reinforcing struts inside.

The sculptures are simply turned off when the weather approaches freezing. The sculptures seem to work well as nonwater sculptures especially if the lighting is right. There are many ways of working with the problem of freezing. You can have a heater and heat the water, or if there is not too large a volume of water, you can use antifreeze: propylene glycol.

I have always wanted to do a sculpture in some cold place where I could keep the water warm enough, just above freezing, so the sculpture would run year-round. In cold weather a vapor would rise off it like mist. It would be nice, but very uneconomical, I am afraid. I am working on a sculpture now that can be allowed to freeze while it is still running, resulting in icicles and cascades of ice in the winter.

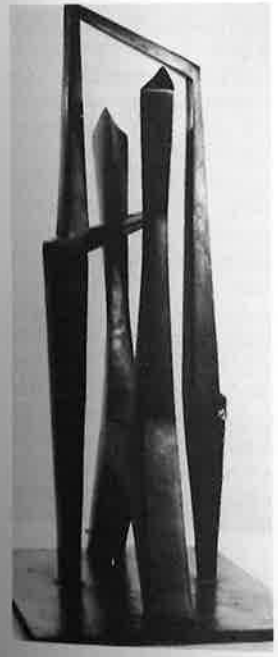
INTERNATIONAL INTRODUCTIONS

Salvador Arango, Colombia
Rodrigo Arenas Betancourt, Colombia
Martin Blaszko, Argentina
Pedro Cervantes, Mexico
Gianfranco Ercolanoni, Italy
Pal Kepenyes, Mexico
Alonzo Rios, Colombia
Tiberio Vanegas, Colombia

Of the Internationals in attendance, the above were among those who made introductory presentations on their own and the work of their areas of the world.

RODRIGO ARENAS BETANCOURT

Latin America is a continent where Yesterday is mixed up with the present and sometimes with the future. Tradition is a constituent and fundamental part of culture and history. In this land there does not exist a rational notion of time; of time as a movement or as a progression, but time and history and progress, are entities which come apart among themselves and mix up among themselves, in an infinite chain. It is the vision of a huge humanity in a religious, mythic, magic and tragic cosmos. Therefore, we as artists in this continent move within aesthetic requirements which are unlikely and not equivalent to the ones known in the rest of the world. We make up part of an aboriginal humanity, culturally hybrid, with a huge latin tradition—indian and black—which impose a social engagement on our work, and therefore, an aesthetic subjection. Artistic creation comes up in Latin America as an anguished and sorrowful unfolding, between the traditional and the modern, between the real and the imaginary, and between the Eastern and the Western.



Blaszko

Betancourt

Kepenyes

MONUMENTAL SCULPTURE AND MONUMENTAL SPACE

Fritz Bultman
Massachusetts

The idea of sculpture as a purely aesthetic object is a modern one. Only in the 18th century did fountains cease to be functional and become ornamental, and from this point art grows increasingly divorced from daily life, leaving sculpture mainly to portraiture, cemetery and salon pieces. Despite sculpture's serious restructuring in the 19th century toward a basic aesthetic, its natural functional value in daily life unfortunately has been even more restricted by the functionalism of the international style of architecture. The Bauhaus ideal of incorporating all the arts into architecture ends by completely denying to the arts their functional existence. In the American city where space is first defined as "main street," and "main street" is essentially a wide spot on the highway, there is a visual poverty unequalled in the world—one which suburban development has only aggravated. It is to this visual poverty that sculpture must address itself using any bridge that connects it to daily life. For example, I have always felt that a spot in a neighborhood where men could wash the ever-present and precious automobile, could gradually reintroduce the fountain just as once there were troughs to water horses. (I remember a rather elaborate cast iron one in the Williamsburg section of Brooklyn.) In New York City, and I use New York City as the most crucial and strangely typical American city, we could place these fountains not only in suburbs but near housing projects, and in a poor neighborhood where the Sunday morning car washing by turning on the hydrant is a ritual. (I understand in England this ritual has cut into church attendance quite markedly.) It is only by daily usage that the aesthetic can again become a part of daily life, just as the Italian fountain was a water source and a place of casual social gathering before plumbing technology directed life in other ways. I use this example because water is a friend of sculpture and one of its components. A piece of sculpture, wet and dry, is two different sculptures. In a fountain water adds a dimension to sculpture, so that we can speak of water sculpture—like the Trevi Fountain, etc.

CAR WASH 1976 Model Fritz Bultman

The modern rediscovery that the basic aesthetic of sculpture is volume, scale and weight, though often unheeded, remains the home base to which modern sculpture can and does return. Since we are addressing ourselves to monumental sculpture, which means outdoor sculpture, these concerns of volume, scale and weight affect us in particular ways. The materials that can be used are relatively limited—modern technology makes promises but cannot prove performance. Bronze, steel, stone, terra

cotta, even cast aluminum that is not anodized powders quickly in the environment and cast iron needs constant upkeep and attention. (The state of that 1870 cast iron watering fountain in Brooklyn can only be described as ruinous when I saw it twenty years ago.) In welded stainless steel it is the welds that eventually rust. Ultimately the material is a minor aspect as long as the *aesthetic of weight* is fulfilled. I start here because weight is often so imperceptible and unheeded. At this point, however, sculpture and architecture find themselves at odds. Modern architecture is committed to discovering the simplest and least weighty and cumbersome solution, whereas sculpture always needs heft and a sense of weight, a solution which allows it to overcome and transform into a soaring contradicit
Constructivist sculptor this element of weight is most provocative, and when it does soar, there is a definite thrill to it. While working my three pieces of *The Catch*, I thought at first that I could introduce the carved wooden elements into the cast bronze sockets, as they had worked quite well with the original carved plasters. But the wooden parts looked flimsy and uncomfortable until I had them also cast in bronze. Then they fit together quite naturally. Since one element of sculpture is overcoming specific gravity, the artist must give it the necessary heft to begin with, otherwise the piece has a toy-like aspect. We sense weight; I do not know if we see or feel it. It was quite to the point that a fabricated piece was tossed off the cliff by juvenile delinquents at the *Newport Monumenta* show last year.

Volume is central to sculpture—to the piece as a whole and to the individual members of the piece. The ancient Egyptians stated that "to think in volume is the intelligence of the heart." The physicality of each piece demands both this displacement, this defining of real space, and juxtaposition of part to part, of volume to volume, to create movement or quiet and overcome matter (Tatlin's monument versus Pisa Tower). There is always a dialogue in sculpture between the plastic existence of the material and its transmission into an image that partakes of the space displaced. I am well aware of the socalled "sculptural drawing" but is this not really a form of bas-relief, the creating of visual space in a compressed volume? Volume is another matter. Its physical actuality can be measured and ordered; it can be expressed either in the simple crystalline geometry of Euclid or the complexities of organic concepts studied and transmuted into form. By opposing one volume to another, a sense of movement can be created and scale enhanced. Volume places sculpture firmly in the sensuous world, and by the disposition of volumes, makes the physical space surrounding the sculpture an active partner. The earth and the universe consist of volumes in relation to each other. Volume is one of the creators of mood in a piece of sculpture, again by using juxtaposition. Since we are concerned with monumental sculpture, volume's main function is carrying *"the presence,"* and here it joins with the scale to set, for once, the exact intention of *"the presence."* The overlarge tends toward mournfulness—see the World Trade Center in New York up close and the Superdome in New Orleans. Unrelieved large volumes remind me of the soft space of dreams, a quality of infinite and undefinable space. The whale supported by water is a huge, graceful creature. The Superdome seems like a beached whale, grandiose, but out of its element, mournful in contrast to the buildings around it. Scale is the most demanding of the qualities I have mentioned because it conditions the actual surroundings. Space demands that a piece of sculpture be created in as close a proximity to its eventual surroundings as possible. By this, a piece has partnership with the space of its setting so that the volumes composing it are

exact and not just provisionary like an armature, to be "fleshed out." We are so used to works wrenched from their context and placed in museums that the sight of a sculpture in its designated and created space is a rare experience. A sculpture must be created in actual size, since a work blown up from a model does not work—it always betrays the mechanical and the mechanic and the sculptor. For some unknown reason, to scale down from large to small does not have the awkwardness of small worked to large—it looks like a model. This is a curious property that needs considerable investigation. Scale is the actual sculpture in the actual space, the site held in reverence, what Melville called "reverence for the site." This alone would prevent the monumental from becoming simply gigantic. One can hope that if this is an imperial age as the newspapers keep telling us it is, the need for monuments may reappear, and by chance open up a new age of official sculpture. According to the foundry people with whom I have spoken, even the Bicentennial brought no increase in the construction of monuments, as they had been led to believe would occur. In the creation of monumental sculpture for buildings of today's size, enlargement alone will not work, because scale cannot be tampered with without destroying the concept of the sculpture. Is Mount Rushmore sculpture? We laugh when we see similar examples of "the huge" presented in films about Mussolini at the end of a long hall, or in the overblown heroics Soviet sculptures of heros of the people, yet this is the scale wished upon us in relation to today's architecture. It is not only because these works are figurative that they do not work; it is because the concept behind them is enlarged rather than monumental. There is no interrelation between sculpture and space.

What I wish to emphasize is sculpture's relation to rather than contrast to architecture. An alternative to gigantism is the collaboration between architect and sculptor to create a precinct, a defined space, both in the interior and the exterior of buildings, where a fusion of sculptured spaces can function: earth works, cement works, water works, and sculptures on integrated monumental scale. These defined and integrated spaces could be within or outside i.e., a loggia on upper floors where there is a view, or an enclosed garden on the ground floor, roofed in part to deflect the wind and define the height. The deflection of winds in high-rise areas might induce people to linger and look. I notice that the speed of walking is proportional to wind velocity, and art, to be seen, needs contemplation. An example of this variety of sculpted spaces is in Gaudi's Parque Guelle, where there is a fusion of several aspects of art to create an "other" atmosphere, and where the monumental can be enjoyed. The monumental takes its place easily among trees and rocks, particularly if the site and the sculpture are worked with each other in mind. What I am concerned about in the foregoing is the relation of sculpture to architecture and, in particular, to vertical architecture that is sculptural with a desire to overwhelm. I have been interested in watching the attempts in New York where there is little coordination of sculpture to architecture to help create a monumental *space*. For example at the Central Park end of Sixth Avenue, there are three equestrian statues, two in one scale and the third of a size all its own; a mixture where none can create the entrance that the Marly horses (salvaged from another site), create on the Place de la Concorde in Paris. Most of the problem at Sixth Avenue comes from a mixture of scales plus a proportional problem with the bases, too high and too remote. With the space in front of the Seagram Building, the monolithic quality of the building dwarfs everything placed in the only outdoor space smack in front of it. The building functions as a rival sculpture, not as a spatial unit.

It may be that sculpture which does not compliment the architecture, but which works in opposition as a foil to architecture, is the only solution. At least one saw the Dubuffet in front of the Seagram Building. One noticed it and one looked at it. It worked as a different element, whereas a recent structural piece was lost and dwarfed. As building grows more functional and Euclidean, the antidote will be excessiveness. This would be true for public painting also, a disunion of the arts.

Louis Sullivan was not only a great architect but also a great sculptor. Since almost in dismay he ceased to create his true fusion of the arts, sculpture in this country has been in public disarray. It is fitting that we try to bring it back onto the tracks so that the last quarter of this century can be a visual age of monumental spaces and sculptures, not only a night age where light displays redeem an appalling daytime vision of chaos, or as my mother who was born in New Orleans termed it, "a whorehouse in distress." That is what we are in today.

NOTES

About my own work I should like to add in a sort of coda, these notes that I made for a recent exhibition.

To transmute experience into a sculpture is the beginning.

The woods, the ponds, the frozen beaches of winter and the vegetable garden present strong images in themselves—they trigger reveries.

My sculpture is the geometry of interior sensations, the intuitive engineering of making weight levitate, of overcoming the inertia of gravity. By this geometry I am extrapolating on the sense of organic measurement suggested by D'Arcy Thompson.

This challenge attracts me to bronze. It has to be activated; it has none of the tensile grace and strength of steel, but it can be solid as earth or thin as a leaf.

Bronze has stages like wax and plaster, of being liquid then solid; unlike them, and even steel, it is as durable as mankind, and stronger when thin and hollow.

By working directly in plaster with a very light armature of wire mesh, I am able to build and to carve quite freely without reference to a rigid preconception of an armature. During the process of bronze casting when the foundry turns these plasters into wax replicas, I am able to correct each of these, giving it a subtle variation. Often in this process the plaster is broken and when I repair it, I change it, making additions or subtractions. The resulting bronzes are siblings rather than identical twins and a variation is achieved that makes each piece unique.

Bronze offers me the chance of making a modern work out of a material whose discovery named an early stage in man's development.

SURFACE-MINE RECLAMATION AS LANDFORM SCULPTURE

Robert Mallary
Massachusetts

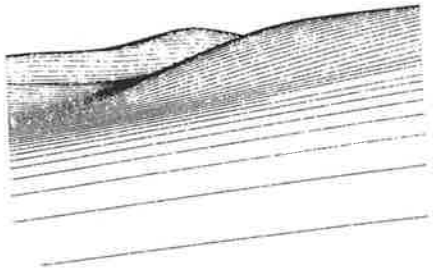
This was presented as a one-hour slide lecture concerning surface-mine reclamation as a form of large-scale public art and environmental sculpture. Every year approximately 40,000 acres of land in Appalachia, the Midwest, and the Far West are mined for coal, after which these disturbed sites must be reclaimed according to standards that are becoming increasingly stringent from the standpoint of environmental protection and visual quality. Of these standards and the various approaches to reclamation they enforce, by far the most influential is known as reclamation to "approximate original contour and condition," which means essentially that the site is required to be restored in a way that makes it suitable for its original use. But in the course of an eight-week survey carried out by the author and associates in the summer of 1975, it was learned that much of this reclamation is executed in such a slovenly fashion that it can hardly be said to approximate the original condition. But in those cases in which the restoration was found to be well-shaped and attractive, he assigned much of the credit for this to the skill and sculptural sensitivity of the bulldozer operators, whom he went on to describe as this country's "authentic earth artists who day-in-and-day-out are shaping acres of landforms on an incredible scale."

Not all of this land, however, is reclaimed to approximate original contour. For, increasingly, there is a tendency to seek a variance from this policy which allows the site to be reshaped and revegetated in such a way as to make it more suitable for a different and "improved" application (in mountainous Appalachia, for example, flat land is at a premium for a wide variety of uses). And since this kind of reclamation amounts to a complete resculpturing of the topographical environment, sculptural standards and criteria should be applied.

Mallary and his associates at the University of Massachusetts in Amherst are deeply interested in the basic aesthetic principles at the root of these standards and criteria and in applying and testing these principles through a computer-graphic program called ECOSITE which they have developed for this research and for the computer-aided design of landform composition for reclamation. (An example of graphic output from this program is shown in the accompanying illustration.) The preliminary findings of this research, supported by a grant from the National Endowment for the Arts, are summarized in a report titled *Visual Design Resources for Surface-Mine Reclamation* (which can be obtained by writing to the Institute for Man and Environment, University of Massachusetts, Amherst, MA 01003).

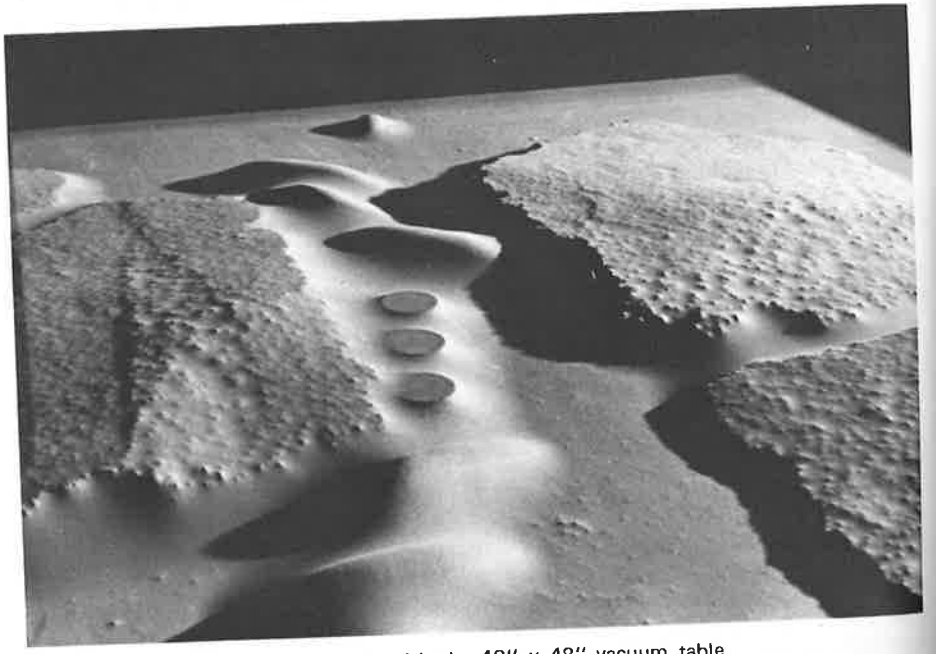
Although Mallary speaks of surface-mine reclamation as a form of land sculpture, his point of view seems closer to that of the landscape architect than the sculptor in that he scorns public sculpture when its motivation is tinged by egomania, a situation which is worse when the sculpture is introduced into a natural setting, and worse yet when the sculptural medium is the land itself. In opposition to this, he stresses the need for the environmental sculptor to harmonize the work with the surrounding visual environment, with the use to which the land is to be put, and with a moral/ethical concept of man's place in nature more akin to that of the Far East than the West, dominated as it is by a continuing Judeo-Christian outlook which is deeply instrumental, predatory, and exploitative in its approach to the natural environment, both physical and visual. He insists that sculptors working in

large-scale public art, environmental sculpture, and earth art are obliged to adopt a more modest, less egocentric and manipulative philosophy, and should seek ways to express this philosophy in an appropriate visual mode.



LAND FORM COMPOSITION for reclamation made using the computer-graphic program ECOSITE

VACUUM TABLE designed for experimenting with landform compositions for surface-mine reclamation



LANDFORM COMPOSITION made with the 48" x 48" vacuum table

MONUMENTAL SCULPTURE: MONUMENTAL, MONUMENTLIKE OR JUST PLAIN TALL

Stanley E. Marcus
Connecticut

Without becoming art-historical in perspective, I submit the following proposition to my audience: that the main body of our public sculpture no longer fulfills the traditional role of the monument but that it does continue to function in a monumental capacity. In order to get on with that contention, I should like to deal first with that body of public work too large to be ignored but so limited in content as to merit the epigraph of "Just Plain Tall."

Under that aegis falls perhaps the vast majority of public sculptures produced in this country, and which more accurately might be referred to as architectural sculpture. They are most commonly located within lobby confines of graceless recently erected structures, on lawns of corporate headquarters where they serve as trademarks, or at confluences of public roads such as squares where they are cultural punctuation marks. Though these works masquerade as art, the controlling hand is that of the architect. There are important advantages for the architect employing this kind of art. He is assured that there will be no need to deal with temperamental artists, that the work will be in good taste, the materials and workmanship will be of excellent quality and last but most important, the work will be far less expensive. He can be free, therefore, to take a hand in deciding how well forms integrate with their surroundings and what color schemes are best suited. In an article for *Art in America*[1] Amy Goldin described three criteria for public art: a) It solicits a wide audience; this is certainly not the case in architectural sculpture since it does not solicit but like Muzak, hums softly in the background a discreet song of culture. b) It deals with a subject matter of recognizable social import. c) It should contain a moral sense. That architectural sculpture would venture into such areas as (b) and (c) is unthinkable. We may as well dismiss architectural sculpture on all three counts. In actuality the last two criteria of Ms. Golding do not apply to any contemporary work, a problem that she gets around by saying that today's public art is really private. I do not agree with Ms. Goldin on this but do feel that as a rough guideline to public art of the past, her criteria sum up the basic points.

I think David Smith has said it loudest as well as most frequently and accurately. In a 1957 lecture at Rensselaer Polytechnic he saw art as a decorative detail of architecture. Specifically, he saw no place for Lipchitz, a sculptor whom Smith considered to be in the monumental vein. He was incensed that when the United Nations Building was designed and erected by Harrison and Abramovitz, there was no art for the inside. Five sculptors were called in to do remedial work on a podium whose background had been referred to as a "wall of police buttons." All five refused. He believed that architects consistently felt and probably still feel that sculptors' demands for prices are too high. In economic terms Smith is correct. Sculptures do not insulate buildings, aid the plumbing or, no matter how anthropomorphic, assist in the running of elevators. On the contrary, at ten dollars per square foot occupancy rental, sculptures represent an ongoing cost. The consequence of this attitude is a number of sculpture factories which produce work that looks like sculpture, or more accurately, the

[1] Amy Goldin, "The Esthetic Ghetto: Some Thoughts About Public Art" *Art In America*, Vol. 62, No. 3 (May/June), p. 31-32.

work produced in a beginning three-dimensional design course, and for a fraction of the cost. By way of alternate solution, the Treasury Department during Depression Days required of public buildings that one percent of construction costs be set aside for artwork, a policy still followed in Philadelphia, a city that is noted for the quantity and variety of its art. As for the Treasury Department, its policy kept a thousand or more artists at work during the dark days of the Depression. This, plus the Federal Art Project, resulted in the consequent rise of American art and most notably, of the New York School to a position of prominence which it continues to hold some forty years later.

Leaving aside architectural sculpture, let us consider what we mean by "monumental" sculpture. Does the public sculpture of today meet the criteria of that which is considered monumental? I believe the answer to be it does not in the traditional sense, but in a new way it does.

If we think about the traditional role of monumental sculpture, it is easier then to look at recent work and see what points of similarity and difference exist. For this look at the past, Ms. Goldin's three criteria are of value. She has indicated that public art should solicit a wide audience. This is patently so, whether we think of monuments or of paintings. One way of focusing attention is by scale. We are assured of public interest whether it be Trajan's Column in Rome or the 151 foot high Statue of Liberty in New York Harbor. Indeed, scale is such a powerful device for soliciting attention that after forty years in the wilderness of South Dakota, Gutzon Borglum's Presidential portraits of Washington, Jefferson, Lincoln and Theodore Roosevelt continue to draw large crowds of tourists. Borglum built his reputation on scale: carving a mountainside in Georgia (General Lee), a six ton bust on Lincoln, and a forty foot long, thirty-two foot high casting in Texas.

Her second criterion is that public art must include social importance. By this she means that the audience must understand what the subject is about, that it cannot be private. Furthermore, it cannot be a trivial subject even though widely recognized. The figure of Will Rogers by Jo Davidson standing in the United States Capitol is not intended as a monument to a well-known teller of jokes, but as a tribute to characteristics of Rogers which are valued in our society.

The third requirement of Ms. Goldin is that the work solicit a moral response. The monument is far more than that. In our secular society we are denied a pantheon of gods. We have no all-seeing protectors on whom we may depend when forces erupt that are too potent for us to control. We then turn to the past and trust in the greater wisdom of our forefathers to have secured for their descendants the kinds of institutions which will see us through the stormy weather. Thus, we reserve our greatest reverence for the makers of our *Constitution*. I am convinced that there are more monuments to the Founding Fathers than to any other group of people. Yet, just as monotheism requires focusing on one god, so must our attention be riveted on one man. Who else, but the Father of our Country, George Washington? If there is a second focal point, it would be when our country was divided against itself. Still our institutions survived, thanks to the great Abraham Lincoln. Appropriately, the two largest monuments in the focal point of our country, the nation's capitol, are dedicated to these two men. Is there a section of our country, no matter how remote, that does not know of these two or of the monuments to their lives? To reverse Mark Anthony, the good was not interred with their bones but with their shortcomings instead. Gore Vidal in his book, *Burr*, takes great delight in showing the real or fancied shortcomings of the Father of our Country. We do not wish to know them. Indeed in another age, Vidal might well have been considered a traitor or, at the least, unpatriotic for his treatment of our hero.

Having indicated, if somewhat too briefly, the nature of what should be expected in our monuments, it becomes a not too difficult task to determine the aesthetic qualities to be sought in our monuments. Scale, for example, takes on another dimension. It is not just a device for attracting attention but of heightening the awe to be inspired by the giants of the past. Is a fifty-story shaft too high for our most prominent hero or a building 188 feet long and 118 feet wide too large to house the giant Daniel Chester French statue of Lincoln? The artist is obligated not only in terms of scale to inspire awe but to give a sense of nobility that the viewer may feel a sense of pride in belonging to the same society from which sprang our giants. If Lincoln is to have a wart, then French must use it to advantage to make Lincoln human despite his greatness. This in turn becomes another attribute. Underlying the aesthetic of the monument is an awareness by the artist that every stroke of the chisel must add to the grandeur of the work. He must completely subordinate his own sense of importance to the shaping of a figure who is greater than himself. Above all is a need to continually focus attention of viewers. Under the glory of the man is the glory of the institutions which are embodied within and represented by the man. Lincoln incorporates a vast number of characteristics all of which cannot be catalogued and so must be represented by the statue itself. Thus at the heart of all monuments is an indivisibility, a sense of oneness in which a number of complex ideas can be summarized. The Tomb of the Unknown Soldier does not need scale because it already exists in the staggering number of deceased heroes, so many that only one unknown man can possibly represent them. The Tomb of the Unknown Soldier has its own built-in scale. The skill of the artist is not needed or even desired. We do not go to the Tomb for an aesthetic appreciation of the artist's work which under the circumstances would be superfluous or even profane.

In the face of such vital purposes for our monuments as visual embodiments of the pillars of our society, calling our sculpture of today "monumental" takes on the appearance of vanity. Is there a contemporary sculpture that is as deserving of the title "monumental" as is the tragic figure of Henry Adam's wife, symbolizing as it does, eternal values for all of us? Certainly, I am not saying that the sculpture of today is inferior to that of the past. My point is that the monumental sculpture of the past was based on an entirely different aesthetic than the public art of today. If there is a monumental art today, the monument is not to traditional values embodied within the abstract or realistic form of some past hero. Rather, the monument is to the artist himself. I am particularly reminded of a vast fiery-orange steel Calder stabile which was plumped down into the midst of an exquisite classic park in Hartford, Connecticut. It is so large and the surrounding buildings so close, that one may view only segments of the work. No matter where one looks, the viewer is reminded of Calder's handiwork. For those who might have preferred to look at the setting and enjoy the serenity of the area, there is no chance. The park is totally and completely dominated by the stabile thus making the sculpture, in the real sense of the word, a monument. Whether there are implicit values for society in such a monument is however, another story.

Historically the issue of monumentalism versus a primarily visual public art can be dated to somewhere between 1928 and 1929. It was then that Picasso was approached by a municipally-appointed group to make a memorial for Apollinaire, the poet, who had died shortly after World War I and who had been close with

the Cubists. In response to the possible commission, Picasso approached Julio Gonzalez and under Picasso's direction, a welded model was constructed by Gonzalez. This is probably the first welded construction to have ever been created and was the source of inspiration for David Smith to begin his own career in welding. The work was rejected by the committee and in the light of the previous discussion, their action is readily understandable. The work does not honor Apollinaire, but Picasso instead. In his use of a new medium we recognize in this work the ability of Picasso to be highly innovative. There is nothing in the work that reminds us of any virtues which Apollinaire may have had and that were of such value to society as to warrant the expending of public funds. Most important is the unfocused openwork of the structure. With the single exception of the solid disc head, the work consists of a series of punctuation rationale for the monument. For it is precisely the quality of permitting visual focus on a single form which can contain within it a diversity of ideas that is the *sine qua non* of the monument. It is possible to date the death knell of monumentalism with the artistic development of the unfocused aesthetic.

David Smith quickly latched onto the idea of the unfocused field, at first intuitively and later, theoretically. For him the destruction of the object was not only appealing intellectually but psychologically as well. The rise of welding as an art form has been paralleled by the fall of monumentalism. In essence since welding involves the joining of two parts, its basic format is anti-monumental. The final emancipation would come with the economics of welding. Its materials already exist in the form of beams, tank-tops and bars. Thus to make large-scale sculpture, the artist need not depend on patrons, a factor which as we know, has limited him to those tastes of the ones who pay. With liberation the artist now is free to celebrate himself and need not pay homage to those whom society might deem more important. With that liberation, however, has come, surprisingly enough, an enslavement of the patrons. With their guide-lines shattered by the demise of monumental art, they must now come to depend on names instead of their eyes. Consider *Sylvette* by Picasso for example. In terms of sculptural form the work almost does not exist. Its essence is a series of black painted lines depicting a woman's head and painted on a slab of concrete whose form has been determined by the contours of the head. Wash away the lines and the sculpture loses all its significance. As a drawing it has merit, but little as a sculpture. The same thing may be said for the famous Chicago sculpture by Picasso. It is essentially "painterly."

The simple rigid wire structure of Picasso's 1929 construction had become, under the hand of Smith, a highly expressive format whose elements were maintained within an almost flat frontal plane. *Hudson River Landscape* of 1951 is, in its own way, as two-dimensional a work as the Picasso. Because there is no solid plane on which to paint the forms, the forms depend on the quality of the free-floating line becoming what Clement Greenberg described as drawings in space. In his Cubic series the lines had begun to take on a sculptural quality because of the massiveness of the linear structures. In an interesting reversal, *Voltri VI* turns the line into a negative force. Picking up on the same idea of linear forces but working in a much stricter Constructivist vein, has been Kenneth Snelson. As sculptors have begun to work their way out into space on a large scale, opportunities for expressiveness become reduced by the needs of logistics for structural soundness. Thus on the surface, Mark Di Suvero seems to be working in a much stricter Constructivist vein than is actually true. His steel beams run true not because he has no interest in the bending and twisting of the steel lines such as were seen in *Hudson River Landscape*, but because his sources of material must come from the building trade. Yet, the irrational comes through in the arbitrary placement of the girders, the mixing of steel and wooden beams, and most particularly, in the arbitrary manner in which paint is applied. Colors appear to be applied in random fashion and clearly express the artist's freedom of choice.

The successor to David Smith as seen by William Rubin, Curator of Painting and Sculpture at the Museum of Modern Art, and Clement Greenberg, art critic, has been Anthony Caro. Working in a figurative manner and heavily influenced by Henry Moore, Caro came to Bennington, Vermont, in 1960 and saw the work of David Smith. The first result of that experience was *Midday*, 1960.

By 1967 Caro's work had stretched far out into space, but rather than upwards and frontal as Smith had worked, it expanded horizontally as can be seen in *Prairie* of 1967.

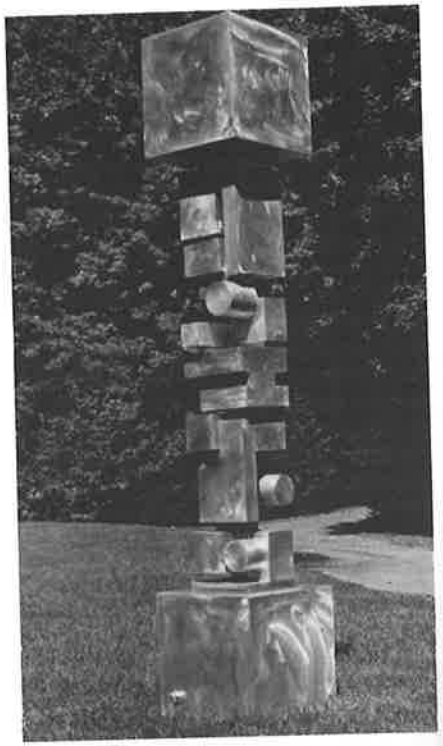
In his work of 1969, Caro clearly began to work upon the ground. His work can be seen as related to it, rather than to space. Such a possibility had earlier been explored by Giacometti in his *Woman With Her Throat Cut* of 1930, as well as in the *City Scape* series of the 1940s. For Giacometti, however, the ground was a foil on which to express his thoughts on the human figure, whereas Caro by contrast, had made the ground a fundamental part of his aesthetic.

By 1971 Caro seems to have completed his exploration of interplay between ground and sculpture and began to raise his work vertically though continuing to explore the horizontal. An important consequence of Caro's sideways movements in space as seen in *Riviera*, for example, is the denial to the viewer of any possibility of seeing the figure. He exemplifies the attitude of contemporary sculptors who seem willing to explore every possible avenue of sculptural expression with the exception of monolithic form. Negative space has crept into every crevice of what used to be monolithism, altering, bending and fracturing it so that we can no longer remember the sculpture's shape. The rejection of memory goes *hand in glove* with the anti-traditionalist attitudes of our artists.

Monumentalism has been defeated at its source. Its purpose as a single recognizable symbol functioning as a reminder of civic values, has been declared aesthetically obsolete. I respectfully submit that this Conference has been badly misnamed.

photos next page

GRAPHIC LANDSCAPE
Stanley E. Marcus



DOUBLE SPACE FRAME
Stanley E. Marcus

SCULPTURE AROUND THE WORLD

Yaacov Agam, France
Ted Bieler, Canada
Martin Blaszko, Argentina
Elizabeth Catlett, Mexico
Suren De, India
E. W. Hawthorn, Australia
Max Lyle, Australia
Victor Temmerman, Belgium
Arkom Vorajinda, Thailand

BLASZKO:

I want to thank the members of the Sculpture Center for having invited me to this important meeting. It is, for me, of significance because this is the first time I have had the opportunity to meet some of the colleagues whom I have admired for about twenty years. I met here yesterday, Isamu Noguchi. It makes me happy to see him and personally tell him, "Thank you for your wonderful work." As you can see, I am very emotionally impressed. You know that a sculptor has a special feeling for communication by works when they are of high quality. The other point I want to mention, is that I am also excited about the intense enthusiasm and activity of the friends of this important meeting. It does not happen frequently that the inhabitants of a city are so much socially-minded as to make a conference like this so extremely effective.

Let me tell you something about Buenos Aires. I come from a city where we have a very strong and deep tradition about sculpture. Buenos Aires was the first city in the world to erect important pieces by Rodin 70 years ago. We also have, I think, the most important monument made by Bourdelle. Unfortunately, this tradition was cut off 30 years later. In making a comparison between the situation in Buenos Aires now, and the situation here in the United States, it is very encouraging and revealing to note that the American efficiency and dynamics are surpassing countries which have a long tradition in this kind of activity. I do not know how many museums existed in the United States 70 years ago, perhaps only two or three. But now you have art collections at every university, and works of sculpture are being integrated into urban life, fulfilling their mission in a social context, pushing and stimulating creative forces of people who move around them. So my being here with you is, for me, a source of inspiration.

There is another point to touch upon. I do not want to go into aesthetical questions at this moment, but the problem of the relation of the artist, the artist's work and society, is something I feel most intensely now. In sculpture, you must take into consideration works which have been done thousands of years ago, because these sculptures have a presence which act directly at any time, continuously. We can admire, today, a work created long before. There are outstanding works in Italy and Spain, and in many other countries which are appealing to us very strongly. So you see that our art has one important advantage: it speaks to you always whether it was done 100, 500, or 1,000 years ago. I want to mention the economic relation between the inversion in a work of art and the public surroundings. A work placed in a proper setting remains on view for many years and speaks to millions of people. This effectiveness and lasting power of communication has no comparison with other undertakings in the field of art. Another problem I want to refer to now, is the shortsightedness of a special kind. During the last 20 years all over the world, we have lost many great sculptors. We have lost Pevsner. We have lost Matisse, who was a great sculptor besides being a great painter, and many others whom you all know. But, though all of

these artists were in full possession of their media, their talents were not used in the greatest dimension of their possibilities. They were not used for society, to enrich and to enhance our public surroundings. This social myopia intrigues me, too. But I am admiring the activities here in New Orleans because there have been steps taken just to improve this aspect. This is another reason why I am happy to be here with you.

And now I want to show you some of the slides I brought from Argentina. The first slide is of a work by Pablo Manes, who studied with Bourdelle. He was the first sculptor to bring the modern language of form to Argentina. I do not want to deal now with this kind of language, since there will be another opportunity for this. This is a piece called *Tango* which has a significant importance in Argentina's music. This piece, *Acrobats*, is placed in front of a theater in Buenos Aires. The activity of placing sculptures in Buenos Aires is just starting now. We made a great effort six months ago to convince public authorities in a city 300 miles from Buenos Aires to raise a sculpture garden. The people became very excited about it, and, just three weeks before I came to New Orleans, they invited me to see the piece of land where it would be convenient to make this park. Now we have a nice beginning in this regard. This is my work, a project for a monument, my entry into the international competition for the Unknown Political Prisoner held in England. It was exhibited in the Tate Gallery in London years ago. This is another project for a spacial monument. Personally, I have a special feeling and need for making sculptures which should fit into public surroundings expressing a particular characteristic: monumentality. I have no time to deal with this aspect now, but I hope to have another opportunity to explain the difference between monumentality, size, and the main points which decide whether a sculpture, small or huge, has monumentality or not.

This is another project for a monument, also mine, done a few years ago. This kind of piece has another density. You know, a man, during his lifetime, changes. New experiences broaden his vision, and, consequently, his style always reflects these changes.

As time permits, I want to mention some of my aesthetical opinions. It takes me sometimes many months or years to organize proportions within a sculpture, because I believe that this is the important point. Sculpture should be able to impart its essence in accordance with our physiological internal movements. Here we touch a very intriguing question which every artist tries to answer: the conquest of a high aesthetical quality; this timeless value; that mysterious content we feel at the first glance at some

ESTRUCTURE PARA Martin Blaszko

artist's work, and which is so difficult to reach. Sometimes I think that there are rules which can be learned, but very often, great works are created with their own rules; the goal of reaching and apprehending an agreement with reality does always move running away. But on the other hand, we can observe a consensus of common conviction when people face works of great quality. This means, I think, that there must be a secret order which appeals to many people in the same way. Besides, I am looking for a structure which should express the "spirit of our time," the common denominator of the "Zeitgeist." I believe that a synthesis might be found, equivalent in meaning to the composition of Piet Mondrian but with other characteristics. For me, this characteristic can be described with the word "Bipolarity." My time is over. Thank you very much.

VORAJINDA:

Good morning, ladies and gentlemen. I am glad to meet with you today. Before I came, arrangements were made for a Thai student to translate for me. However, now that I am here, I cannot find the student. Therefore, since I speak very few words of English, my presentation will be short.

My country is very old and our many examples of sculpture are in the traditional style. For a long time in my country, we have had a strong religious influence which has governed our sculpture style. But now, the sculptors in Thailand are meeting the new styles and techniques of contemporary art. I came to America to study these new techniques and new styles for my country and university. I am pleased to find so many very advanced sculptors in one place, here at this conference. I am glad that I came, and I hope at the next Conference in Toronto, Canada, there will be many more sculptors from Thailand in attendance.

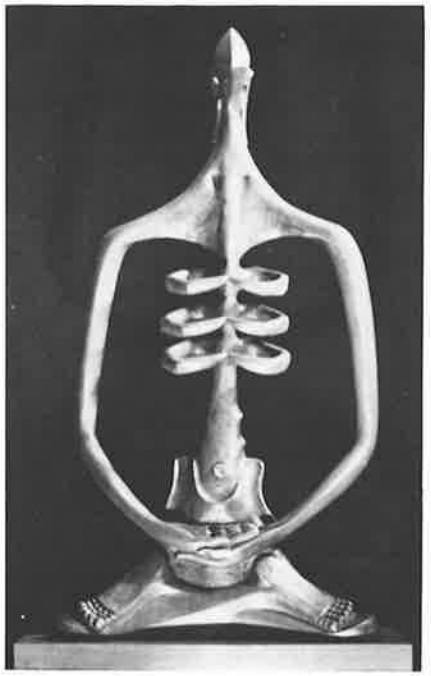
This slide is of the face of a Buddha image which is about 800 years old, and is of the Sakothi Period of my country.

When I studied in the Arts and Crafts School in Bangkok, I studied the traditional style of the East, and when I was in Rome, I studied the traditional techniques of the West.

This is my work when I studied at the Arts and Crafts School 15 years ago. The first is formed in mahogany wood, and the second is made of teak wood.

This slide is of the new idea made about three years ago in my house.

I made this landscape at my university about two years ago. I am finished.



NIRVANA Arkom Vorajinda

HAWTHORN:

Ladies and gentlemen, I remind you that I am standing in for Mr. Max Lyle, who is the official delegate here, so this is very impromptu. There are two things that I have noticed about Australian sculpture which I should like to pass on to you. First

of all, if something is produced in New York on Monday, it usually appears in Australia on Tuesday. I guess, in time, it will appear there on Monday afternoon. Secondly, I do think there are some artists in Australia who are looking at their own culture and the nature of the country itself, which is generally very austere; it is a hard country, it is not lush. This quality, the harshness of the country, can be felt if you go for a drive in the outback. It is common to see many skulls and bones on the side of the road. They are not human skulls, they are kangaroo, wombat, sheep, etc.

This welded steel sculpture tries to capture the rugged skull-like forms that you can find in the country.

HIERONYMUS BOSCH'S SKULL
E. W. Hawthorn

In this particular piece of sculpture, which is cast aluminum, there is a sort of figure-feeling inside another form, a sheltered feeling. The environment is hostile, and one needs to be sheltered from it both physically and mentally. Much Australian art, both visual and literary, is concerned with this theme.

I come from Perth, the capital city of the state of Western Australia. We feel very isolated from the rest of Australia, as we are separated by a vast desert region. The symbol of Western Australia is the black swan, and in this welded steel sculpture 18 feet high, I have incorporated the swan into a sun dial, as we have also a great amount of sunshine in Perth.

Australian sculpture, in my opinion, exhibits two main characteristics.

First, features associated with the *avant-garde.*

The expression of ideas that are international, e.g., conceptual art and expression about and with materials that are characteristic of contemporary technology—e.g., stainless steel, plastics, Cor-Ten steel, laser beams, oscilloscopes, drawn tubing, etc. Much of this work tends to be unidentifiable in terms of *place*; It is strongly related to *time*, e.g., the early 1960s, late 1960s, early 1970s, etc.

Second, features of the country and cultures.

These works may have social, religious, political and mythological overtones, or, as in many cases, they derive much of their inspiration from the environment, e.g., dry desert, harsh landscapes, the wonder of nature, etc. Hence, the sources of inspiration are the same as in any other country. What may be different, however, is the timing and wealth.

Thirty years ago, the then-contemporary sculpture predominantly consisted of memorial and statuary work. The past 30 years have witnessed the tuning into the creative edge of international thought and disposition, somewhat later than painting did in Australia.

With the increase in wealth, both in the private and public sector of the community, plus a virile and ebullent building boom and generally rapid technological development, sculpture began to be accepted more frequently in public places, galleries and private collections. The largest Australian cities supported the greatest growth and now display many fine Australian and international sculptors' work, often in the form of fountains.

Within the last five years, the Mildura *Arts Festival*, through governmental agencies, has established itself as the prime sculptural event every two years. If present trends continue, then sculpture, as a medium for expression in Australia, should help to enrich our lives and make a worthwhile world contribution to other inhabitants of this earth.

DE:

From pre-historic times, sculpture has been India's major art. Her achievement in it is more rich and manifold, more intense, more characteristically Indian, than any other form of art. In the classical works of sculptures, the sculptor has transcended material barriers to attain a profound metaphysical expression. Best examples of this period are rock-cut sculptures of Ellora, Elephanta, Mahabalipuram, and temple sculptures of Khajuraho, Konarak etc.

Compared to the long and great history of our ancient sculpture, the modern phase is very brief. The prolific outburst of the medieval period was followed by the Islamic invasions and rule when sculpture as an art was rejected, though architecture and painting both attained a new synthesis. With the advent of the British, a Western academic art was imported into the country. It had the patronage of the government and sanction of the Western Classical Tradition behind it. This transplanted art might indeed have achieved a local flowering if it had been closer to the Indian spirit. The multiplications of this art are still with us, though the trend does not lead to new pastures. A new art and a new vision were naturally slow in appearing, but have now arisen as a secondary spreading wave. Its opposition to the past lies in its unwillingness to conform in its affirmation of freedom. This new art has led to the shapes and forms of the modern period and embodies in its language the aspirations of contemporary man. Contemporary sculpture is growing; its merit lies in the achievement, but even more in its potential. It is a young tree bearing the early flowers of promise.

In India the rapid changes in the nature of art have isolated the creative worker from being an integrated member of society. He was its spokesman and sometimes its prophet. His work often reflected or expressed the feelings of his people. But today, although a new sculpture has begun, the understanding between the producer and the public is still weak. The majority of people have not had enough experience or training to enjoy the new works of art.

During the last fifty years the character of both art and artists has changed; a new phase has begun which stresses changes and individualism. If, in the past, the artist was the spokesman of society and the existing faith and feeling towards generally accepted epic themes, then today the position is reversed. The creative thinker dreams, visualizes and invents; he creates new implements and new forms and makes new discoveries in science. Indeed, science itself is the greatest single factor that has affected our lives. It also has affected art.

In India, while we have begun to use technological materials, there is no general acceptance of a technological language in art. Occasionally, the new sculpture echoes a few qualities of the machine and machine-produced objects. India's ancient sculpture was linked to her great religions. In modern times we have seen the secularization of art. No longer is art concerned with embodying symbols or images inspired by faith; rather the images of art are only the symbols of artistic aims. We have now an art which is only art, that is, each work has no other meaning than that presented by its own existence.

Confusion reigns in the realms of contemporary Indian sculpture as, indeed, in many of the other creative arts. The general public accepts the photographic busts of political leaders on the rounders of our highways. The architects of the buildings demand the tawdry sentimentality of decorative folk-figures on the facades of their buildings. The noblest monuments,

erected by the middle class intelligentsia, are often fake heroic equestrian statues of feudal chieftains, charging the air, sword in hand. The richest patrons wish to buy immortality by having revivalist temples constructed with copies of medieval sculptures, even as they announce that they would like to rebuild Konarak Temple without erotic friezes. A few professional artists and their students experiment with the old-new materials, even as they question the hypothesis of 19th century European naturalism and search for the fundamentals.

Actually, on the highest point of the struggle, controversy rages between the traditionalists and the modernists. This battle between sentiments and ideas is often bitter.

These general observations are made as a necessary preliminary to the understanding of the causes of confusion in the present day Indian outlook about sculpture and to suggest a way out.

The decisive changeover from the old values to a completely new and alien system of work was, unfortunately, as casual as the absent-minded English rulers had preferred everything to be. But, deep underneath the surface, it began to be realized that what the ancient and medieval worlds had experienced, the new modern world would take a long time to achieve.

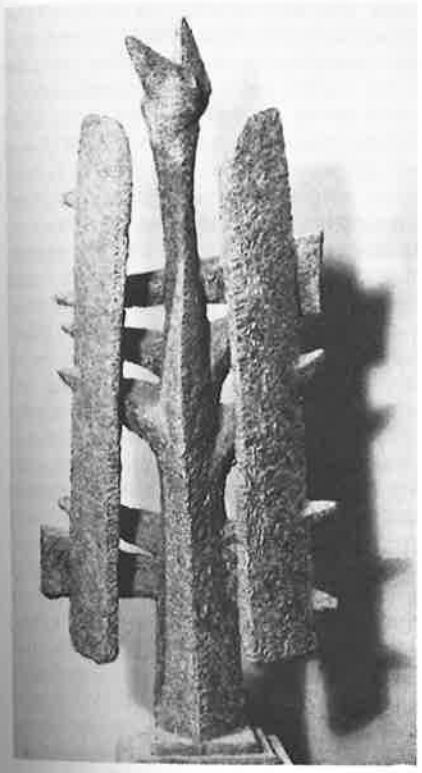
The age of sculpture, which seems to have produced an atmosphere for the highest freedom for the imagination of man in the West, has not yet made much headway in our own country. The reasons for these lacunnae have already been indicated. The most important cause for the breakdown of one of the greatest sculpture traditions in the world was the political domination of India by the alien British power for nearly 200 years, and by its imposition of the English middle-class style, such as sentimental portrait sculpture, false Imperial glory, and naturalist imitationism of the Graeco-Roman models in the art schools of India. Nevertheless, several efforts have been made, unknown to the West, towards securing freedom of the imagination within the context of the new synthesis between Indian and European techniques, materials and forms, rendered possible by the universal struggle to subordinate the machine to human genius.

Significantly, the major contribution in liberating the imagination for the handling of sculpture forms, was made by the great painter, Abanindranath Tagore, towards the end of his life. The fact that Abanindranath Tagore was a pre-Raphaelite revivalist in painting, gives great importance to his experiments in free sculpture.

Regarding my creation in sculpture, I am submitting the following thoughts which are guiding me, inspiring me to create more and more forms in three dimensions.

Foreign visitors are often disappointed when they see Indian contemporary art, because it is no different from that found in the Western World. They do not find vitality and beauty in classical Indian or Oriental art. It should be obvious that tradition is not the object of a treasure hunt, to be dug out of the sands of the past. Tradition must be in our blood, an integral part of each of us. Hardly had Indian modernists started to make various styles of their own when the storm of World War II burst with explosive fury upon the seedling of modern art. From this, both art and artists have changed; a new phase began which stresses change and individualsim. The fundamental desire of life is the desire to exist. It claims from us a vast amount of training and experience about the necessities of livelihood.

Reality, in all its manifestations, reveals itself in the emotional and imaginative background of our mind. We know it, not because we can think of it, but because we directly feel it. And therefore, even if rejected by the logical mind, it is not banished from our consciousness. The consciousness of the real that is within me, seeks for its own corroboration, the touch of the real that is outside me. When our surroundings are monotonous and insignificant, having no emotional reaction upon our mind, we become vague to ourselves. For we are pictures, whose reality is helped by the background, if it is sympathetic. As for this world, that which can be known through knowledge, is limited to us, owing to our ignorance; so the world remains to us like a procession of



STRUGGLE FOR EXISTENCE

Suren De

nomadic shadows. Accordingly, to the stages of our consciousness we have more or less been able to identify ourselves with this world, if not as a whole, at least in fragments, and our enjoyment dwells in that wherein we feel ourselves thus united. In art we express the delight of this unity by which this world is realized, as humanly significant to us. We have our physical, chemical and biological worlds. We have our personal selves, which have their communication with our feelings, sentiments and imaginations, which lend themselves to be colored by our desires and shaped by our imageries. People often ask me about the meaning of my sculptures. I remain silent, even as my sculptures are. It is for them to express and not to explain much. "Art is the guest that comes and remains. The other may be important, but art is inevitable."—Tagore.

LYLE:

My name is Max Lyle, and I come from Adelaide in South Australia. I should like to say a word of thanks to the Sculpture Center for inviting me to come. I am on sabbatical from my college after a number of years teaching full-time in the Sculpture Department at the South Australian School of Art and previously, in the state of Victoria. In Australia we really do not have a sculpture scene as such. Sculpture in Australia had its beginning in the academies of Europe, and, after World War II, we had a great influx of migrants. In many respects, Australian sculpture owes much of its stimulus to the migrants who came from Europe and elsewhere. We have sculptors in Australia who are working and stimulating the scene and come from Europe, mainly; we even have people from the North American continent working there, as well. Australian sculpture is a very broad term. It came of age with the fairly accidental introduction of the Mildura *Tri-Annuals* in 1961. Mildura is a town in the state of Victoria on the Murray River in the northeast of Victoria. It is a grape-growing area; there are many migrants there, too. This served as a catalyst for Australian sculptors to work for a particular event. And during the 1960s, particularly, this was very stimulating. Mildura became a meeting place for the whole continent. The Australian continent is nearly as large as the United States. So this was a tremendous stim-

ulus, and we owe it to the director of the Mildura Art Center, which it later became. In the 1960s the exhibition kept to the lawns in the front of the gallery, but in 1973 it extended right down to the banks of the river and covered several acres. Not only was object-based sculpture shown, but also more conceptual works, so it really has become an art event. Sculpture as a discipline is represented very solidly, but also things sculptural as well. We had earth works and all manner of media used which made it more into a three-dimensional art event. In 1975 there was a special event held at Mildura to celebrate *Art Victoria* for the state of Victoria. These were a series of art events which occurred all over the state of Victoria, and were very interesting indeed. Mildura was part of it.

What I would like to bring out in what I will say is that, first, there is a great need for an exchange of students of sculpture in particular. Fine Arts students need to travel internationally, preferably for fairly long periods of time, and I would hope that this sort of conference would institute proceedings, delegations if necessary through governments, to make this happen. I do not know how one would do it here. I do have quite an insight into how it would be done in my own country. If I realize that there is a mood in countries like the United States, Canada and other areas, then perhaps we can do something on our side of the Pacific. I will say something about New Zealand sculpture, too, which is also represented at the Mildura events. It is quite a strong area for three-dimensional work. The other thing I would wish to bring up is the need for sculpture to relate to the community, especially local communities, and if I may take a little time, I have been involved in a project. It is one of two projects in Adelaide for which the Education Department of the State of South Australia, originally instituted the idea of having a community center within a school and a school within a community center. We had two suburban areas in Adelaide, one of which was an inner suburb, while the other was a more "outer" suburb. I was invited by the visual arts board of the Australia Council to act as a consulting artist on one of these projects. The project was an interesting one because one had to cooperate, with all sorts of people and organizations other than the architects. One had to cooperate with the local mayor, as well as the schools in the area which would use the community center. The schools were mainly secondary schools which were going to shift to the area, and the community center was almost going to be interwoven with the schools. The school area would be broken up, segmented. There was a shopping center and a residential area all within that school area. As a result, the concept of the "learning street" for the secondary school students, grew up. And I think it is still a very interesting social experiment. As an artist, I was asked to see how works of art, not only works of sculpture, could be included in this complex. We involved quite a number of ethnic groups, as well, in this project, and it is the sort of thing, the sort of relevance, that sculpture should have to the community. It is an on-going process, and the projects we hope will go ahead within those areas would involve the participation of those communities in the making of works of art, and also the use of modifiable elements that can be changed by the passers-by, the school children and the community, generally. We also looked into the use of wind, sun, all the natural elements that we have plenty of, being south on the continent. We have over 300 days of sunlight, and it would be a pity if we could not use the sun and its influence. So a number of projects are based around solar energy. A number of projects are based around wind, and so on. The rainfall had something to do with one of the projects, too,

and I imagine that on the continent of North America, one could also use snow, although we do not have snow so far south. I think the importance of community involvement in this, in this kind of way, gives a new perspective to the kind of role that an artist and a sculptor could play in the community. It would seem to me that the artist is a fairly misunderstood member of the community, and if by this kind of means the artist could be accepted as a working part of the community, then I think that for the artist and sculptor, this is a status which is greatly to be desired.

CATLETT:

I apologize for bringing my slides, and not the slides of Mexican sculptors, because I did not know that I was to be on the panel representing Mexico. As a Mexican sculptress present at this International Conference, I am perhaps the least one indicated to represent Mexico on the panel. This is possibly the unconscious reason for the ethnic clothing. I must look more Mexican! For although I am a citizen of Mexico, I was born in the United States and was partially shaped as a sculptor as a part of the Black community. But Mexico has opened her arms and welcomed not only political refugees and tourists, but also sculptors from all different parts of the world. Of the five Mexican sculptors I have seen here at the Conference, three are from other countries. This may partially account for the international, as well as the national flavor of the sculpture produced, for it varies to include most of today's contemporary sculptural concepts, as well as production based on the great Mexican sculptural heritage, the Pre-Columbian terra-cotta and stone carvings. Until the 1950s, sculpture was completely nationalistic in concept. Several experiences have altered this, such as a rebellion of the then-young artists in the 1950s, the aforementioned presence of artists from other countries; the role of the relatively new modern art museum in presenting major sculptors with different tendencies from the United States, Europe, and the Latin American countries; the production of the friendship route during the 1968 Olympics in which the sculptors from 18 countries were commissioned to design large concrete abstract works to line a freeway in Mexico City. Although these works have little to which the average Mexican can relate, they create an awareness of sculpture that is inescapable. I must include mention of the official patronage of sculpture by government agencies growing out of the Revolution of 1910. From works by individual artists to the former National Sculpture Bi-annuals, this patronage greatly stimulated sculptural production. I wish to conclude by telling you of the condition that exists in our country, a condition somewhat unique in the art world. This is the inclusion, rather than the exclusion, of women sculptors. Top women sculptors are working in different media, some in an exceptionally large scale, in democratic competition and cooperation with men. It is also a stimulating situation which has the potential of a young, restless generation of sculptors who may well develop Mexican sculpture into a moving national and international force. I will show you six slides of mine in different Mexican materials. I should like to tell you that it is a sculptor's paradise for wood, stone, bronze casting, and for other materials that sculptors use.

White marble.

Tropical wood. I am trying to tempt you down to Mexico with some of the materials that we have.

Orange onyx and a black marble. I must explain also, that I am a figurative sculptor, because I wish to communicate with the mass of people, people of my two branches, I would say—Black people in the United States and the Mexican people, primarily.

This is bronze and the last one is onyx. Thank you.

BIELER:

Dealing with the main theme of the Conference, monumental sculpture, I should like to briefly survey the forces which are at work in Canada to encourage and discourage that kind of work, and give you perhaps a more detailed account of one particular program which focuses on the kinds of problems artists have to deal with when they have the opportunity to work on a very large scale.

The City of Toronto is where I come from and is one of the major art centers in Canada. Two other major centers, I guess, are Montreal and Vancouver. One of the observations a number of people have made about art in Canada (which perhaps has even more emphasis in terms of sculpture) is that it is becoming decentralized. Sculptors, in particular, more often are working away from the urban centers. The fact remains that in Toronto we have an active gallery scene, which is perhaps a more comfortable state for artists, or rather, it is a very comfortable state for artists to work in. There is a strong tradition to deal with sculpture in room-kind sizes, a tradition which galleries tend to encourage. In working with that kind of scale, obviously the technical problems and the experience of dealing with scale are not nearly so critical. So in Canada we have an active gallery scene. We have vast outdoor spaces not just in the cities, such as in Toronto and certainly in Montreal where the outdoor spaces are on a very large scale, but in the country as well. One of the problems, then, is how to encourage artists—sculptors—to gain experience and technical ability.

There seems to be an unshakable assumption on the part of governments, which I think is largely the function of the fact that the people who administer those kinds of funds, are people who are primarily related to architectural concerns. In other words, the administrators are largely architects and engineers who see sculpture as related primarily to spaces related to buildings. Obviously, that has a significant role to play. I think that there must be some encouragement for works other than those necessarily associated with architectural settings. Historically in Canada, there was not a great deal of activity in terms of large-scale sculpture until about 1967 when, in Montreal, the 100th anniversary of Canada's incorporation as a country was celebrated by an international exhibition. This event immediately demanded that the available sculptural talent in Canada come up with large-scale works. I cannot think of many people in Canada who had that kind of experience in sculpture. I had only a couple of one-man shows and had relatively little exposure and, yet, I did a number of pieces for *Expo* at that time. It was a rather immediate, forced situation where people who had worked on a small scale, because they were asked to work on a large scale, got their feet wet very quickly. The advantage of that kind of situation was that it was temporary. Many of those pieces went up and down again, quickly.

The architecture was obviously an opportunity for architects to explore their own fantasies. There was a brief period of quiet after that, when the debts for that particualr exhibition were being paid. Gradually, more activity started to occur on the federal and lower government levels.

Now to give two examples of the kind of sponsorship which is available in Canada and the kinds of problems and issues it raises: The major sponsor is the Government of Canada Public Works, which would be similar to that kind of program in the States and is on exhibit here at the Conference. That program is based on a one percent of the cost of all the buildings which are put up by the federal government, whether they are airports, office buildings, post offices and so on. It is administered through the Department of Public Works by, again in this case, primarily architectural people. This program created a situation in which only the artists who had contacts with architects were getting any work. A change was made and a committee was set up to select pieces of sculpture and murals that architects had submitted to them and were proposing for their buildings. That committee gradually became more important and eventually started to initiate some of their own ideas in terms of who should be doing work. There is a new phase which is an attempt, not to circumvent the architect entirely, but to try to come in contact with more artists who are not necessarily in contact with architects, and who are doing things which architects recognize as being viable images for their buildings. I would say one of the primary issues in Canada at the moment, in terms of the relationship of artists to this particular program and in relation of artists to works in public spaces, is what kind of work is appropriate for public spaces. We have some kind of image of what monumental sculpture is, but there might be many other kinds of large-scale activities which would work. I think our definition of what is monumental has to include a wider range of concepts than what has been happening so far, in terms of what I have seen, anyway.

The way in which this program is being organized is as a kind of image bank. I do not know how that is going to work out. It started only last year. Artists have been asked to submit about a dozen slides of their work to a central bank of slides. Architects can then flip through photos of pieces that are not necessarily works in public places but are private works by artists. They can decide what kinds of things excite them and then invite those artists to make proposals for their particular spaces.

I want to quickly mention one other program. I am involved in a program for the metro level of Toronto, in which the subway company initiated an art program to place art in public, in the subway system. The plans immediately ran into public rejection, though on a very small scale, and the artists were then asked to create a public response. It has been interesting, because we got that response.

AGAM:

I should like to talk to you about an experience which differs diametrically and completely from what you have just seen. It has almost nothing to do with what you have seen now, or have accepted and judged as a work of art and sculpture. Sculptors until now have been using the media of stone, marble, and other materials which stand against time as an idea of the past, to conceptualize something which happened, something which would stay against and defy time—materials which do not represent change or life, like a gravestone. This has come from a very old age, when man wanted to defy time, because time kills, time destroys. People thought if they could make something stronger than time, they could save themselves from death. This can be seen in the pyramids, which are an expression to defy time. Sculpture continues this trend, when art, by definition, should express life. It expresses anything except life. The most constant thing in life is change itself. If you follow all the works of art throughout the history of painting and sculpture, you will find they are always on a static relationship of the elements in which the dimension of time, of change, or the fourth dimension never occur. So I and some others, for many years, have followed a way to enlarge the vocabulary of art, giving it the opportunity to introduce the notion of life. The most important thing in life is the unexpected, the constant change and the constant "becoming." Each time you see a work of art, it will be different. It could never again repeat the same form which once you saw. Once you have seen traditional sculpture, you have seen it. What you saw yesterday, you will see today; what you have seen today, you will see

tomorrow, and you have a poor idea of life, the creative, majestic, and fantastic experience which is life itself. A work of art should express the idea of life like it is. It is very difficult to express this notion through slides because they are also static images. Tomorrow there will be a movie in which you may more or less see things happen, and what happens will never happen the same way again.

Let us discuss a few materials and the concepts which allow us to open this new dimension in art, especially for sculpture, the constant "becoming" and the constant flow of change. Art which at the same time allows the public in public places to have a direct dialogue with the work because they can touch it, change and participate with the idea of the work on a spiritual level with the artist. In the past, when an artist made a work, he imposed it on the public, and the public could not see or accept his point of view on it. Here, like in music, they can play, they can choose, they can interject their own views on a work of art established for an infinite variety of possibilities. Because the law of plastic creation was based on static relations, and here it is based on dynamic relationship, the change is like that in physics from Newton to Einstein. For Newton, physics was one situation of the world, and here we are arriving at a dramatic situation of possibilities, even to such an extent that you cannot describe what would happen because nobody can describe what will happen one minute of tomorrow, today. This force of natural reality I have tried to introduce into the work of art. The people who have seen it immediately have found another dimension of themselves and of reality. In this respect, I also wanted to examine something of the visual expression by elements most of which you can touch and feel. We know that the most important forces in reality are invisible. As a matter of fact, nobody can see power. Power, by definition, is invisible. You can see only the reaction of power. If I look at my hand, and I clean my hand, and I think it is empty, there is nothing there. If I place a small transistor in it, all the world is there. I can hear New York, Washington; the whole world is in my hand. So there is a reality which is invisible. How is an artist to express it? For example, I have used a Radar DUPLDR system, used by airplanes in which, as the result of the slightest change and movement in space, a sound is created relevant to the character of the movement. At first, people were hesitant about moving, astonished by the phenomenon. Then there was only the movement of a few. Suddenly, everybody started to move in his own way, in such a way that they began to dance and to make crazy and inventive movements so that they themselves became visual sculpture, and the participation became total.

Sculptures have been done with fire and water because fire and water cannot stand still. Both are expressions of life. I have done sculpture with enormous bubbles of three to four feet, which are born in front of you, appear and disappear. I have also done tactile works which, when you touch them, create movement, and they appear and disappear. These will be seen in a movie, but I will show you a small object which can give you a visual expression of what I have talked about.

Again, there present on the table in front of him, was a small sculpture hardly bigger than a heart, made out of gold-plated brass with nine moveable, interchangeable elements. As he touched the art work with his fingers, the sculpture started to dance and vibrate like a beating heart.

Then, touching the sculpture again and again, he created out of the same work, many different designs and shapes, each position and situation distinct from the other.

He invited some of the audience to transform the sculpture, themselves, thus demonstrating the faculties of change possibilities and participation,

and the dynamism of the art object which exists as a form, a "possibility."
TEMMERMAN:

When the universe began, it was a living thing; breathing and moving, infinitely, big, probably filled with swirling clouds of gas and dust. ALL became *LIFE* and *MATTER* in *TIME* and *SPACE*.

It may sound important, as it is, but because we are here at a sculpture conference, let me make a couple jumps in *TIME* to bring us up to date.

From the beginning of time, man has always tried to think in terms of wholes to bring the most complicated things together such as the physical and metaphysical. Is it not true that heaven stands for total happiness and hell for something like total failure? Is the word, "universe," not only a word, but a symbol of what we like to understand and be understood?

Let me be a little more dramatic, by quoting Buckminster Fuller, a great master in "time and space" and a great American, too! "Man seems unique as the comprehensive-comprehender and coordinator of local universe affairs. All other living creatures are designed for highly specialized tasks—man not—and the creative man is doing what he is doing to prove that." I think this quotation of Fuller could be sufficient for my "play-ade," Sense . . . Non-Sense! But to be sure, one more Fuller quote. "Normal man is designed to be a success, and the universe is designed to support that." Isn't it fantastic?

Now, "Great Scale Monuments."

First, a little bit of history.

From the very beginning of time, man seemed to be the only one who could adapt in many if not in any direction, toward nature, and that, because of his mind and his possibility of choice plus the coordination of facts, makes him responsible for his own change and the changing of his behaviour. Behaviour was something totally different to man than to other living creatures. For example, man can loose time; a plant or an animal can not. Man gives value to invaluable things such as little stones, souvenirs, gold; animals do not. Have you ever seen a bird wearing the feathers of another bird? Man made his house, individual or collective, and changed it in time. The nature creature, bird, built its nest forever and never changed it. Man has adapted to climate, even swimming and flying. How about a diving canary or a flying turtle? So as we already see, man was on the road and only going ahead. Whatever "back to nature" may be, is not our problem now?

Anyway, the consciousness of man began by the discovery of his hands. Making tools was a natural act, and using these tools, as an extension of his hands, was his first attempt for the better. Later, his products became more effective, and before not too long, man came to the discovery of his talents, his inventiveness, exploration and exploitation, and to his "designing." This meant that sooner or later, man's "handy-work" was enriched by personality and vision. Man became successful; his products led him to exchange with the others of his species. It was a small step to trading, business, marketing, banking, and so on. I am sure that it becomes clear to you that after the discovery of the hands, the discovery of the brain led to consciousness of good and bad, further to individual choice, and on to the recognition of "mastership," efficiency, specialization, effectiveness, and dominance. Later, technology announced itself and was leading straight into super-specialization the world around, to world-man and leadership.

Today, the whole world is practically discovered. Man is in a stadium from exploring to surviving, as Fuller said, with all the problems involved.

Now, after centuries of changing conditions (and by a retrospective view on what has to be done first) I think we may assume that the first instincts of man have been traditional. Look at his first handy-work: tools, buildings. This tradition and his evolution were, I believe, more or less an exchange

and battle of fundamentals from his primitive origin to the art of things. What we call "tradition" is the simple manipulation of existing things to achieve order and/or function. For example, a man using a shell as a substitute for drinking out of the hand. Piling up stones in order to find the means of holding them up. Both are natural and constructive. Is this, then, the consciousness of honesty, or is it a first contact with form, time and space? The rural basis of technology, the first seeds for sophistication, form and content; a contact with logic and evolution; the total man going on forever.

On the other hand, may we assume that form is not a science, but rather originates by man himself from the beginning of all time, and goes on that way? Yes, as Peter Cook wrote in *Action and Plan*, "The simple excavating, piling up of stones, bringing it all together, becomes infinitely subtler (subtiel), to see, to be part-of, visually part-of, to make it work for you, and me, unseen." I ask myself, "Has this something to do with civilization and culture?" I believe this was as great a breakthrough of the so-called "wheel-civilization" up to the space-age in both psychological vision as well as in physical terms. Could this be called "technology," too?

I hope we have discovered by this simple "analysis/synthesis," man's ability and sense to create. May this/his ability to create defy the limits of reason which is central to the creation of an idea. Returning to honesty in space, form and time, is this not the fundamental part, i.e., to recognize "vision" and the "experience of greatness to shock"? To see the openness for the "fantastic" which have anticipated events, into "utopia"? Is it not from the infinite choice of "parts to create" that the power remains (overblijft) for a "total concept"? Nevertheless, against this assumption, we still have the idea that technology can provide most, if not all, of the answers to the problems of design. Although an attractive idea in the abstract, it still remains that design exists in the dimension of time as well as in the dimension of space. Now, to come a little more closely to the reason of myself being a sculptor-designer, let us take a look at the world of monumental sculpture today.

The criteria of sculpture in general, are largely those of "design," first; "clarity and/or organization," second. This should not frighten us, because everybody has a different interpretation of the words "clarity" and "design." Not only this, but as the choice of knowledge and methods becomes greater, the range of interpretations widens, too. (Revolution of the technique.) Big-scale sculpture is more than that. It has, already, the product of society reflecting in its forms through some embodiment of an ideal, a people, a nation, an attitude, a time. Is this a "social substance"? Is not the work, the sculpture, built by people for people, to be in their possession for all of them, such as a public museum for an unique masterpiece? That is in contradiction with the traditional museum of which Somaini Crispolti once said, "Museums are a kind of self-service of individual artistic satisfaction." Anyway, we all know that the art-preserving museums are well-protected places, respectable and necessary, but hard to keep alive. Nevertheless, great cultures always brought their masterpieces to the forefront, frequently in the middle of active life on cross sections of intense activity and common encounter. We know that sculpture, as an art of pattern, is one of the oldest recorded. Now, the wider technology and the intellectual questioning in the study of design begin to take effect in the creation of "Big-Scale Things." So we see a real breakthrough in sculpture today as a natural spirit of freedom, by a new inspiration, totally environmental—a sort of "dynamism by scale," as a new communication by His omnipresence. Very good examples are: the cybernetic fountains of Isamu Noguchi at the World's Fair in Osaka, Japan, showing light, sound, form and space in one embodiment of dynamism; *Grandeur*, a unique piece on a unique place in the fourth dimension; *Place of Peace*, Hiroshima . . ., and another example would be *The Towers of Mexico*, 1958, on the turnpike to Satellite City, by Mathias Goeritz (illustrious speaker at this Conference as is Isamu Noguchi). The Goeritz Towers are impressive in scale and simply THERE with built-in activity—quiet, distinctive—going up in the air to extract out of the weaving of space a symbol for his own inspiration. All in all in full swing!

Another wonderful example is the Eiffel Tower of Paris. He who has not seen the Eiffel Tower, has not seen Paris. There is a tremendous power implicit in the scale and in the forces involved. There is no thrust or movement, just air and space, up and up, as a symbol of the time; doing things; as pure communication of spirit.

Another "wonder of the world" is the 206 meter high *Monument to the Dream* by Eero Saarinen, better known as the "Jefferson Memorial" or "The Gate to the West" in St. Louis, Missouri. Monumental as it is speaking for itself, and the technology involved in pure stainless steel, it captures space and holds it up as do the pure fundamentals of great sculpture. Being an extremely difficult design, but a simple-looking sculpture, it is an homage to the designer, to the computer age, to the sophisticated technology without which it never could have been built. The work is as great as the man who created it, and who, coincidentally, never saw it finished. It stands as its master's footprint to eternity. I know there are many more good examples in the world. I am sure other speakers will handle the subject further.

Let us come back a little to the philosophy of creating. You know that in our times, architecture is no longer the dominant method of organizing cities. Zoning laws, urbanization, highway engineering, etc., define the basic environment. Architecture becomes more and more its "infill," as sculpture practically was. But now, by sculpture going big, it becomes part of the urban planning as a creating act. Talking about creating, do you know the most fascinating thing for a creative individual in a concept of "big-scale"? Well, it is finding the scale of the image, the abstracts of the commission (not the final object as much). In this way, sculpture is the most explicit of the arts, away from the "artificial," giving experiences a further dimension. The process of creating a big-scale comes from the abstractness of a series of "ideas-at-one" plus a number of variables, briefings, and points in between. As there is no such freedom of concept in great scale things, there is no ideal situation, geographically, politically, or any condition or information from our immediate environment. It is out of such frustrations that one can handle reactionary, even revolutionary, as in scale and in concept, to compensate for some kind of hell with the logic of the inevitable.

Let us now compare in a brief historical review, once more, the "Sense or Non-Sense" business. Let us evaluate by ourselves.

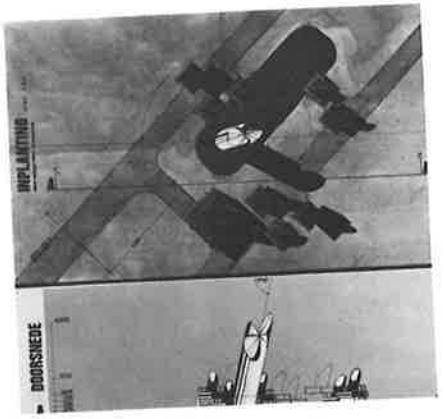
What made the primitives build Stone Henge, or the Dolmen Easter Island, Altamira, and the cave paintings? What made the pyramids in Egypt and in Mexico, the city Macho Pichu on 4,000 meters altitude in Peru? What made the temples in Greece and Rome, the cathedrals in the Middle Ages? How do we feel about the Leaning Tower in Pisa, Da Vinci, the Renaissance (century of science), the Pre-War period, the Industrial Revolution, up to the Eiffel Tower in France, not to talk about the New Symbolism in our Space Age, or the electronic revolution, over-information, *New Babylon* By Paolo Soleri, the *More With Less* by Fuller, *Population Explosion* by Paul Ehrlich, etc.? We can go on and on. I think this new consciousness leads to a new collectiveness, up to a delightful and well-founded individualism. Yes, there will be temples of great

belief, sometime. On the other extreme, man did not change that much; it was only the means. He became more sophisticated, keeping his natural talents, doing his own thing (thinking), as B. Fuller remarks, "exploring with his talents, fulfilling his desires and trying to be good at it and better."

In spite of this hopeful thinking, in design and sculpture there is still the client (as a part), the designer (as another), and the technicalities. The interpretation of these forces, conditions, and abstracts is that they reduce the whole possible thing so low. There is no other way than to take the whole process through the technological limits, looking for all the help you can get in man as in technology (team), calling in politics as well, retaining consciousness and honesty to produce the best you can, and better.

Anyway, believing in doing your own thinking and not willing to be in professional isolation, one can no longer hold on to the whole process doing it all alone. He must go to the task of synthesis coordinating and leave the driving to others. Is this not some kind of a reflection of a social awareness? Yes, we have been through a certain number of revolutions since the heroic period of the so-called primitives, and of lately, there have been three revolutions in design. First, the Industrial. The re-encounter and beauty of the machine. Bauhaus and de Stijl retro Jugend-style, etc. Second, the Social, Individual freedom, doing your own thing (thinking), freedom of space, plus all the "ism's" in art, reactions, manifests, emancipation, and other movements ending in "modern" times. Third, our Second Machine Revolution. The electronic, the computer, the revolution of context, peace and freedom by strategy, motivation spaceship earth, drugs, pollution, flower kids, etc. All in all, organize your own knowledge and experiences to a personal belief, keeping the abstracts in balance. To end this "Sense" or "Non-Sense" theoretical part, once more back to the classical.

As one aspect of our century,



SPACE MONUMENT Victor Temmerman

we have been very much interested in the development of the human personality and its nature. The classical view of human nature and human factors holds that the individual is identical throughout the whole of the species; the mind composed of a mental substance, the body in change or variation identical with the mind. So the classical and the modern are really different. You know that modern man accepts that every individual human being is a special case, directly related to freedom. This is the moral value in art. It is the drive for freedom, discovery, and contribution to the richness of human experience. It draws attention also to other values in the world, such as those connected with material and matter like social, financial or political power.

I do not believe that the ideals of the human spirit are carried in manifestos, catalogues, or proclamations. I believe they are carried in the hearts and minds of creative people, creative artists. Since artists are fighters for freedom, freedom of the imagination, "La raison d'etre" for all of us, let this be a substitute for despair, oppression, and violence. I have tried to express my own vision on great-scale sculpture by lighting up the "Sense" or "Non-Sense" of the existing man and his by-product, his creating things. simply by accumulation of extracts of existing theories of the great masters I have been quoting. Let me come to a conclusion by quoting Arata Isozaki: "Only one thing is certain; the future will contain the ruins of the present."

MY GRATITUDE: The Director H.I.S.L. Dr. J. Janssens, Gent, Belgium; Mrs. De Backer-Van Ooken, Minister Nederlandse Kultuur; Mr. Van Elslande Minister Buitenlandse Zaken, Belgium; Professor Elden C. Tefft, Director, National Sculpture Center, Kansas; Professor W. Van Damme, Publi-Photo, Gent, Belgium.

BIBLIO: Quotes from Buckminster Fuller, Peter Cook, Somaini Crispolti, Arata Isozaki. Free interpretations of a "rencontre" with Buckminster Fuller in Kansas City and at the University of Kansas, Lawrence, 1969. Free interpretation of a",rencontre" with Archigram in London and Paris, and *Action and Plan* by P' Cook. Some literature not traceable in common publications.

WELCOME

Sheldon Hackney, President
Tulane University, New Orleans

Tulane University is pleased and honored to join with the University of New Orleans, Xavier University, and the New Orleans Museum of Art to participate in the Ninth National/International Sculpture Conference, the first to be held in this city.

My particular discipline is history, which is far different from sculpture or any of the other fine arts, but as I discovered in talking with some sculptors last night, there are a number of similarities in the way we work and in the way we try to solve our common problem of imposing order and form on the materials with which we work. I suspect our (historians') materials and techniques have been more stable over time than those of contemporary sculptors. We historians still recognize Herodotus and Thucydides, who flourished in the fifth century B.C., as our old masters and preceptors. Phidias, who was only a few years their elder, has been called the greatest sculptor of ancient Greece; but judging from what I have seen and read recently, I wonder if you venerate him today as we do the historians of ancient Greece.

Plutarch tells us that Phidias superintended the construction and decoration of the Parthenon. Modern historians think it more likely that his pupils did the job which may indicate that you can not always believe what historians say about sculptors.

I have a soft spot in my heart for the Parthenon because of the reproduction of it in Nashville, near the campus of my undergraduate Alma Mater, Vanderbilt University. The structure and its decorations are reputed to be as near the original as it was possible to make them, in view of the ruined condition of the real Parthenon. However, in place of the thirty-foot gold and ivory statue of Athena Parthenos which stood inside the building on the Acropolis, the Nashville replica contains a disappointing marble statue about eighteen inches high on a pedestal. Also, the Parthenon at Nashville has a cellar, which, the last time I saw it, housed a museum of the Grand Old Opry. If you have seen the movie *Nashville*, you saw the ironic use of the Parthenon as the setting for a cataclysmic view of a corrupt Philistine-American civilization.

Nevertheless, sculptors have done more for historians than historians have done for sculptors if, indeed, we have done anything for you. The Acropolis has meant a great deal to us since much of our conception of the cultures of Egypt, Assyria, and Pre-Columbian America is derived from their magnificent sculptural remains. I am reminded of how Henry Adams, by looking at the cathedrals of Mont St. Michel and Chartres, derived a comparative interpretation of medieval culture and modern culture from the clashing images of the serenity and wholeness represented by the statue of the Virgin with the centrifugal energy suggested by the Electric Generator. It makes one stop to think about the message being left for future historians by contemporary artists.

Yours is a fascinating and important undertaking. I extend to you a cordial welcome and sincere wishes for success of your Conference and the enjoyment of your visit to New Orleans and to Tulane.

MONUMENTAL SCULPTURE: POSSIBILITIES AND LIMITATIONS

Mathia Goeritz
Mexico

Ladies and gentlemen. This is truly not the easiest lecture in my life. For twenty-five or twenty-seven years, I have been speaking in universities, but it is one thing to talk to students, who want to learn something and who think that their teacher knows everything, and it is another problem to face a sophisticated public which really does know everything! What can I show, what can I tell you that would be original or about which you would not already have an opinion? Since this is the first lecture of this entire Conference, I must be especially careful because all the others who will follow after me may accuse me of having said this or that. Above all, I want to apologize because of my bad English. If it is incorrect, please laugh and forgive me.

Today, I shall talk about monumental sculpture. What is sculpture? Well, everything within the third dimension can be considered as sculpture. These days we talk about light sculpture, and a balloon or a flag can be considered a piece of sculpture, and this is where many of us have different opinions. I'll show a little bit of the past, but then concentrate on the present: What sculpture has been; what it is still; and what new possibilities there are.

You want me to talk about large scale monumental sculpture. When I was a student some forty years ago, I was told that monumental is something that has an inner strength and not only a large size. I was told, for instance, that the Greek *Kuros* is monumental because of its powerful inner strength, and many big sculptures have no monumentality at all. When I came to Mexico about thirty years ago and faced for the first time the Pyramids, I saw that size meant quite a lot. It was a great shock, I must say, and I had to correct my whole concept about size. Until then, I had thought that size in art is a less important element. It is a fact that people like to see something important, and so do I, though I realize that we live in an age where monumentality and the monument are not fashionable anymore. We live in a century where most architecture is ephemerous and where sculpture has become ephemerous also (very often at least) which doesn't mean that in twenty years from now, people will think the same way. I remember twenty years ago many artists made projects of a monument for six million people who had died in Auschwitz or about fifteen years ago, they designed the monument for President Roosevelt's memorial. These competitions still exist, and society wants them. In fact, I think the public in general likes certain monuments better than what we as artists are doing today and what we are showing in the galleries. Sometimes I ask myself: For whom are we working? Aren't we also working for the people? Many of us like to do something which is seen and understood.

The sculpture that I would like to make and that I dream of, the things I really like to call "great sculpture," I do. I tried, but I never achieved it. I would like to do something much more important. When I look at our cities of today, monumental sculpture doesn't fit. Even if you place a huge piece of sculpture in front of a skyscraper, it looks rather small because the building is so enormous that you can hardly see the piece or only if you go very near can you see it.

In this century where we have very tall buildings, monumental sculpture has become obsolete. Sculptors try to make bigger and bigger things, but very few are fortunate enough to be permitted to make the pieces big enough. In general, the architect does

not like sculpture to be too important, and the client doesn't want to spend too much money for art. There are all kinds of limitations to monumental sculpture, but since I don't want to extend myself in theories, I think I better show you some pictures.

Here you see a *Menhir* from the very early ages. Monumental sculpture has existed almost as long as humanity. These prehistoric stones were built up, and we still don't know the exact sense of them.

Much later, in pre-Columbian cultures, sculpture, such as the Mexican Giants of Tula, expresses monumentality they were made for, but they are monumental. That's for sure. In almost all early cultures, we find big stone sculpture; Mexico, the country in which I live, is full of them. The Pyramid, since it lost its sense, is no longer a temple. One could say that today we look at a pyramid as a piece of sculpture. We try, through a rather "shi-shi" illumination to give it a more sculptural value so that people like it better. Before you arrive at the big Pyramids of Teotihuacan, you see another pyramid, but it is only a modern sculpture: a monument to the monument. This, of course, is a concept which seems to us ridiculous today, and so are many other things in our cities. There is a housing development in Mexico City, where you see that the Pyramid has become a decorative element for the enormous buildings rising around it. Even the 18th century church has become a monument of the past. In Mexico, we use pre-Columbian sculpture, putting them in rather awkward settings to make monuments out of them. This has become a fashion. In my opinion, it is a crime. It shows how poor our own civilization is. A few years ago, they put one piece in front of the Seagram Building in New York. It simply was out of scale. An *Olmec* head in the setting of a modern square is, in my opinion, a typical sample of our bad taste.

The very talented French sculptor, Francois-Xzvier LaLanne, took the idea of the big head and made it much bigger in size. What you see here is a model, but it is to be eventually built behind the *Immeubles Miroir,* which are the end of the Defense district, a new skyscraper development west of Paris. LaLanne is trying to build this enormous head in a scale which works better. He had to go up to a very big scale. He realized a similar sculpture for another square—a couple of huge concrete doves. What the artist wanted to do was to create an environment that was different from any other square, and he did. If the square wouldn't have the pigeons, it wouldn't have any character. We will talk about the environment problem a little later.

The typical monument of the 19th century, which we find practically all over the world, is out of fashion. For most artists, it is not interesting anymore. We don't make those monuments any more though people like them better than the so-called monumental sculpture which we put up.

This is of a piece by Jean Dubuffet downtown New York. It is not a suitable size in relation to the enormous buildings which surround it, nor does it help to bring order into the confusion of buildings on the other side of the street. This is one of the problems that the modern sculptor faces very often. It doesn't happen very often that there is nothing around that disturbs the work or that the artist can make an entire courtyard where he is responsible for the entire environment.

These days, most so-called monuments aren't monumental at all. Some pieces are just blown up, which is an easy thing to do. If you bring a tiny little thing about two or three inches high which you have done in your studio in clay to a good technician who makes models, he can build it up to twenty-five inches and then again blow it up to two hundred or more feet. Technically, this is possible. The temptation that "everything is possible," makes it easy to build very big sculpture whether it is good or not.

Many old-fashioned monuments have an inner strength or power which our pieces do not have. They are generally also better placed. On the Paseo de la Reforma in Mexico City stands an independence column which has become a landmark. It is a monument dedicated to the independence of Mexico. The sculpture itself is a rather big piece though not especially monumental in its spirit. It represents an angel, and people in Mexico like it because it's our "Angel" (our little Angel). As a whole it is a much better monument than most modern ones. Here, in the United States, you have the huge heads of your former Presidents carved into the mountains of South Dakota. They are, no doubt, powerful, very impressive. The Japanese artist, Tedsumi Kudo, created an abstraction with the same system. He did a rock wall based on the same principle, only in an abstract manner, but it didn't work. It has the disadvantage that it does not have any meaning which the other pieces have. Everybody recognizes immediately Washington, Jefferson or Lincoln. A monument without a meaning is not a monument.

A good client of monumental sculpture is the Church, mainly in Catholic countries. For instance, in Mexico, there exists an enormous Christ figure made out of concrete standing on top of a church. There is another one, a much bigger one in Brazil on the "Sugarloaf." At Corpus Christi, Texas in another church, there is an abstraction by Richard Rogers. This young and very talented artist worked with the same principle: sculpture at the service of an idea, in this case a religious idea. Of course, the idea can also be revolutionary. I am not telling you anything new: The famous project for the *Third International* by Tatlin has never been executed. What has been considered for execution are other monuments, which most people obviously like better. These are realistic, heroic and rather pathetic. Revolutionary monuments or church monuments, both are needed. Whether it is the party of the Church which needs them, that is the only difference.

In a way, the counterpart in the Western world would be Disneyland where you see a mountain as a piece of sculpture. It is the Matterhorn, the Swiss mountain, but they made a piece of sculpture out of it so that people could look at it also in America. A castle has been reduced in size and is not being used as a castle; it no longer is a piece of architecture. It has become a piece of sculpture, hyper-realistic copy of the real thing reduced in size.

Now, let's talk about what we artists generally consider monumental sculpture. Probably everybody knows about the Scandinavian sculptor who worked for (or with) Picasso. Picasso was a clever man who had recognized what I mentioned before. Everything can be blown up and become a piece of monumental sculpture. Picasso didn't even have to make a model. With the help of a technician, his pieces should be made from a drawing. There is one in New York and another in Chicago. None of them are very convincing. There is a great difference between Picasso's pieces and a piece of sculpture which has been monumentally conceived like this example of Tony Smith's *Cigarillo,* a good piece of sculpture in which the artist strives for monumentality and power through very simple, primary volumes.

In Mexico, we have the piece done by a young American sculptor, Todd Williams. It is a rather impressive piece surrounded by buildings in the Olympic Village. It was painted in strong colors. Williams thought of it almost as a roof to hide under. He created this piece within the program of the Route of Friendship as an accent or contrast to the surrounding buildings. Originally, it was not created as part of an environment, but as an independent piece. All of the pieces

we see right now were, in a way, "independent" and represent an art which must be considered art for art's sake. Oldenburgh's famous *Lipstick* is based on the same principle. It creates a controversy with the surroundings, and its "shock value" is typical for modern sculpture in the urban environment. You know that these days every material can be used for sculpture.

As I said in the beginning, almost everything can be considered as sculpture. It doesn't have to be of stone. The New Yorker artist, Christo, designed an enormous phallic symbol for the *Documenta* in Kassel, Germany. It is ephemerous and meant to last only for a few days in the show of the *Documenta*, where he built it up by filling it with helium gas. Then, after a while, the piece collapsed and was taken away. It wasn't made to stand there forever. Fortunately, it didn't.

A few years ago, I saw Christo's *Curtain* in Colorado which lasted only for a day or two. The wind broke it, and it became a different sculpture. It was like a huge flag which fluttered in the wind. No doubt, the artist achieved something big, but his curtain was in reality, only large-sized sculpture. Christo wasn't even interested in making something which stands upon the idea of monumentality as it had been used in the past.

Here is a wool sculpture by Yagoda Buic, a Yugoslavian weaver. She built these towers only for exhibition. They become, through their big size, something more than simple textile columns. Marta Palu of Mexico did something similar—a huge construction of wool. It wouldn't last outside very long. It is only a gallery piece. These days, the artists, as you know, do all kinds of experiments.

Wolf Vostell, a German, proposed to change the Cathedral of Aachen, Germany, by putting this pressing iron on top of it. The project was not executed. It merely would have aroused a lot of discussion. The artist wanted it to be a statement of "anti-art."

In fact, we live in an age of anti-art, in an age of anti-sculpture, surely of anti-monumental sculpture. Many people get angry when they hear talking about monumental sculpture. I do not think that this will go on forever. The fashion will change. Tomorrow, we may see that things which are done in stone may again be considered more valid than the purely conceptual art. Anyway, it is a fascinating moment we are living in though one has to have a certain sense of humor to enjoy the art of today. Let's talk about another chapter.

There are sculptors who work for an existing environment. Alexander Calder, for instance, studied carefully the building before he created his *Stabile* which stands in front of the Aztec Stadium in Mexico City. It is an 80-foot high steel structure, the biggest sculpture he ever did. A very impressive piece indeed. I shall show you a few slides I made when it was assembled just to make clear how the shapes of the building which stands behind it, are related to those Calder used in his sculpture. He called the piece *The Red Sun (El Sol Rojo)*. When it was put together, it was a very impressive moment. It was a happening. The assemblage became an ephemerous sculpture in itself. Unfortunately, Calder was not able to be there at that moment, but when he saw the slides, he liked them very much, and it inspired him to make more works of this kind. From the back, the piece looks very different. It appears very sober. *The Red Sun* is, I think, one of the most beautiful pieces Calder ever did.

Noguchi was one of the artists who started the discussion about environmental sculpture. He made a patio, a courtyard which has become world famous because he was able to create the entire space. He did not want to go outside. He avoided the interruption of additional elements which would disturb him. He assembled things in such a way that they formed an environment. It turned out to be a very happy and successful work.

The Dutch sculptor, Joop Beljon, created similar environments in Holland: Amsterdam, Rotterdam and The Hague. He built concrete blocks through which people can walk, which is similar to some pieces I saw in France built with stones by the architect, Emile Aillaud, who built the building I showed in the beginning with the big head by LaLanne in front of it.

There seems to be a need for monumental sculpture, sometimes a functional need as well as a visual aesthetic need. For instance, this piece built by the young Mexican sculptor Fernando Gonzalez Gortazar is the entrance of a new housing development in Guadalajara, Jalisco, Mexico.

It is a very decorative, but also a strong piece. You realize that I tried to select slides of works which are unknown to you in order to avoid that you see works seen already hundreds of times.

A Belgian sculptor by the name of Jacques Moeshcal, did the huge *Ring* for the Olympic Village in Mexico City. In Mexico, we have perhaps a monumental complex in the sense that everybody goes for monumentality. I personally like big things. That is probably one of the reasons why I settle down there.

Kosso Eloul, the Canadian sculptor, did this excellent piece with which he created an environment of a very special character. I had the photographs made from his invitation card just to show how monumental sculpture works in nature when it is used as an accent.

The well-known piece by the Austrian, Hans Hollein, was a proposition of the ore railroad freight car, a project for a huge piece of sculpture which is almost magical. It is a powerful and impressive thing. It should be built in Poland in remembrance of the wagons which transported Eichman's victims to Auschwitz.

One of the ways the sculptor of today gets some work to do is through competitions. There are quite a lot of local or international symposia which allow him to work in big sizes. Actually, there are quite a lot of things going on right now.

Sometimes the artist is called by the architect in order to design a sculpture for children to play with or to climb over or for another purpose. Sometimes art can have a very definite function.

Here we have a special case. This is a group of columns which form a screen in order to hide a building. (I apologize because this is a work I did myself. I didn't want to show anything of my own, but I didn't find a slide of a better example.) The constellation of Star Towers called *The Big Dipper* was built to limit the square in front of the Sports Palace in Mexico City. The reason was that there is a tequila factory on the other side which really doesn't look very nice. When the president would walk in, the first thing he would see would be the publicity of the tequila factory. Therefore, I built some columns to limit the square. The order in which the Star Towers are standing is based on the constellation of the Big Dipper.

Another "function" is publicity. Here is a sign which has been designed by the young American designer, Lance Wyman, who did the *Mexico 68* logotype. It was used for almost everything as printed material for the uniforms, for all kinds of decorations, and also for sculpture. It could be seen all over the city—sculpture as propaganda, based on the graphic design.

Jim Wines of the Site group did an almost surrealistic sculptural architecture for a shopping center in Houston, Texas. The building looks like a ruin after an atomic war. The walls seem to fall to pieces. There are holes in the walls like after a terrible accident.

On another building designed by

the Site group, the walls are peeling off. The building seems like a joke. It has been conceived as something unusual which people will remember. It produces an impact on everybody. People do not forget it. The sculpture-architecture has a publicity value. In another building designed by these boys, a stone wall fell down. This piece, which they called *Rock Courtyard,* shows how the sculptor can invade the field of architecture. Very often sculptors have been interested in architecture though the relation between sculptors and architects has not always been the most happy one. The sculptor in the eyes of the architect is a kind of a bum, while the architect is considered by the sculptor as a conformist, I would say. There is often a tense relationship between the two. The one is free to do what he wants, and the other one has to stick to a program, but he gets more money and is considered acceptable by society. But sometimes sculptors become architects.

There is the work of Gonzalo Fonseca, an Uruguayan artist who lives in New York and who did this piece in Mexico. Is it a building? Perhaps it is a temple, a monument to himself, if you want to call it that There are other samples by Andre Bloc and Pierre Szekely. Both of them invaded the field of "sculptural architecture." The most beautiful piece of this kind—probably known by all of you—is *The Watts Towers* in Los Angeles, done by Simon Rodia a simple mason who did a most astonishing and beautiful environment of an almost religious quality.

Time is running short, but I want to say a few words on highway sculpture which has been a hobby of mine for a long time. If you put something along the highway in order to make the environment a little more interesting and to catch the eye, then you have a different approach. The highway has quite a lot of life of its own. It was my program for the Mexican Olympics to build a highway for sculpture, a sculptural highway. It didn't come out as I wanted. There were too mahy different people and opinions involved. I had to become a dictator just to save the program, and I hated myself for it. Maybe it would work out better today because it seems that the artists are understanding each other better as one can observe in this Conference. This Conference would not have happened 20 years ago. Only a very limited number of sculptors would have come. These days there seems to exist a growing interest among the artists to establish a communication.

A few more words about highway sculpture: What happens when you drive? From far away you see a wall and a tower. When you drive nearer, the wall seems to grow until the tower disappears completely behind it. Then suddenly, when you pass the wall, the tower is there in front of you. The succession of moving visual experiences is not the one of the "mobile" sculpture such as that by Alexander Calder. Here it is the viewer who moves.

It was not the fault of the artists that the program in Mexico didn't come out the way it should have. It was mainly my fault. I was not enough a dictator. Also I didn't have time to do the project properly. Many of the artists did not know when they sent their projects, where their piece would be placed. In fact, even I didn't know until the last minute. The project had been stopped for a while, and I was told the pieces had to be placed in a park.

There were sculptors representing the five continents. After all, it was not only an aesthetical event. There were extra artistic considerations. I had to plan it in a way so that it would be a complete program. We had to include Africa; we had the Middle East; we had Western Europe, Eastern Europe, South America, Middle America and North America. From North America we had one black sculptor and one white sculptor. You have to have both because the highway was called The Route of Friendship. So everybody had to be there. The Israeli and the Arabs. There was no distinction. A Polish artist by the name of Grzegorz Kowalski presented an excellent piece. It was easy to place. I put it in the curve of one of the cloverleafs where, when the cars are driving around it, it changes all the time in all aspects.

The entrance sculpture to the highway is by the Mexican sculptor, Angela Gurria. Two big horns receive you at the beginning of the highway.

There are other interesting pieces like the one by Clement Meadmore. In his case, it is my fault that it doesn't stand where it should stnad. The piece would have been much better standing in a curve, but it was just not possible.

One of the interesting pieces, though not a typical highway sculpture, is by Constantino Nivola. I am especially fond of this piece because it has a strange, monumental value. Nivola is an Italian. He painted his sculpture with the colors of the Italian flag, the same colors as in the Mexican flag. Since he had been a great friend of Le Corbusier and wanted to build the monument to the Peace, he converted the famous "hand" designed by the great architect into a dove. The piece is full of symbolism

Another piece by Helen Escobedo changes in an interesting way the moment that you see it.

The articulated wall by Herbert Bayer, the Bauhaus master, is the greatest achievement of the whole highway. Bayer used prefabricated concrete beams. His sculpture was by far the cheapest of all the monuments. It stands on a pretty good site and the driver who comes near, has the impression that the piece changes all the time. It's exactly what highway sculpture should be.

Sometimes the sculptor wants still more. He wants to invade the city! Not only the parks, not only the architecture. He also wants to become the city planner. The Belgian sculptor, Constant, made a project of a city. He calls it *New Babylon*. Architecture becomes art when it becomes imaginary. The movement of architecture prospective has been created by the French critic, Michel Ragon. The artist is coming up as an inventor of new city shapes. Also, Buckminster Fuller did projects like that. His Tetra City project is a dream that one day may inspire future architecture.

For me as a sculptor, everything is sculpture. It depends only how one looks at the things. It is very impressive if you drive through an oil refinery and see the huge towers looking like sculptural elements. Then I forget even that they are good for something; I only see their beauty.

The ideal sculpture, the one which impresses me most, is the city of New York if I look at her as a huge piece of sculpture. That is the kind of sculpture which I would like to do. Of course, that is a dream, but the possibilities of those dreams seem to be possible.

What I have shown is only a limited little section. It could go on for hours, but my 45 minutes are over, unfortunately. In sculpture, like in every other art, limitations are within oruselves. We can't do more than we do. Speaking to you as a sculptor to sculptors or to people who are interested in sculpture, I must confess that there are a lot of things going on which I do not understnad, but I am not angry if I do not understand everything.

SLIDE PRESENTATION

Beverly Pepper
New York

In all my work there has been a yearning for the monumental, the large statement, which has its logical culmination in a scale approximating our contemporary industrial and technological landscapes. My work has always been oriented outward—sometimes vertically outward, precariously outward, sometimes horizontally outward. What appears ground-oriented is the root to sustain the outward movement. The vertical and horizontal planes are used as pauses. Horizontal is the movement of time; vertical is the line of stasis, a man standing. They belong together; they are the corollaries; they imply each other. But monumentality is not necessarily connected with height, but rather a striving after a sense of height. It exists in the tension between movement and interruption.

I want my forms to mirror the paradoxes that today constitute the emotional reality of *man in nature.* Thus, the problems I have consistently explored in my work concern sculptural illusion of natural phenomena. In my works of highly polished stainless steel made in the Sixties, the mirror surfaces acted both to emphasize the physical bulk of the steel and to permit it to withdraw behind a screen of reflections. The reflecting sky, earth, grass, and water were used to complete the work. Now the entrance of the actual environment causes the work to almost disappear while charging it with more content.

When the site calls for it, I have brought these materials—grass, wind, sand, and snow—closer to the surface. The source of tension is no longer the fluctuating surface. The conflict between the depth and sculptural surfaces has been transferred to a question of natural surface and sculptural surface. In some works, the visibility itself (disappearing at times under sand or snow) is at stake, thus creating the tension. Sometimes, simply the threat of disappearance (under the elements, snow, sand, or under its natural surfaces, for example, could the grass spread and take over) creates the necessary suspense.

I will show you a series of slides that give you some background of my first monumental pieces. These are in 1963 and they are of three-inch steel. The one on the right is at the Walker Art Center; the other is one of my first walk-through sculptures where I became involved with experiential space.

Then we jump ten years. This was in 1971, the first in a series of *really* monumental (in scale rather than in concept) sculptures that I have done.

This next one is in Boston. The conflict between the urban background and the sculpture is evident there. The one on the left screen and on the right are of the same sculpture: *Alpha*. It was a problem which was new for me. I had been dealing with inner mysteries, cavities—the angle of cantilevering, creating fields of tension, of defense, and of attack. These should have been made larger, but because they were not done as a commission, the costs made a larger scale impractical and impossible. Although *Ascension-Descension* is ten feet tall, it is not something you can walk through, which makes it difficult to really have an experience inside the space. Here is the same sculpture in both a man-made environment, the city, and in the natural environment. As you can see, it takes on a different personality in each place. These are sculptures that were made to walk into with difficult exits. It is the beginning of another kind of illusion, the illusion of weightlessness. This sculpture, when you walk through it, seems to be all the same size and shape, but you really

can not walk straight through it; sometimes you have to turn.

This is a sculpture which I should like you to experience—the complete process from conception to fabrication. Made in Dallas, it is a three-hundred foot automobile-oriented sculpture, designed to be viewed from an automobile in motion. Its shape and contex change with the speed of a car. The sponsors, The R.D. Nasher Company, received an A.I.A. award for the building in the background for which they wanted me to make an indoor sculpture. I felt there was no place for sculpture; the building was complete without sculpture. I told them it needed none.

Although I had never been to Dallas before, I discovered that it was really a suburb with no landscape, and that nobody walked anywhere; it was a place where people drove. As we left the building, I pointed to this median strip and suggested using it as a site for a sculpture to be seen primarily from automobiles. They liked the idea.

I had to consider the relationship of the patterns of the sculpture, based on the speed of the automobile, what could be seen through the area of the automobile, what could be seen through the area of the windshield and the windows. I tried to make it interesting in both approach and passage—sort of an adventure that would reveal itself, but not just from one point of view. It is two feet below eye level, and the grass grows through it completing the voids. The idea is, that as one discovers the invisible area in these works, he might experience a new landscape.

This is the sculpture in the factory and you are seeing simply the long median strip area of it, the part that would go two feet below ground. It seemed to me, at the time of the making, that it was enormous—too big! There were other problems, physical problems, such as, what about the drainage? How will the grass grow? We had to work out a gravel and a watering system inside and underneath the sculpture. Here we are installing the sculpture. This is what I call "the hillside" part of it. We decided not to excavate the cavity beforehand, as we had done on the land canal. Instead, we would sculpt around it. The portion you saw being installed is just a shell. I decided that we would put the shell down and then fill it with earth, and that we would shape the earth around it, because it gave me more liberty. In my experience with the canal portion, I was limited to the depth that we had dug underneath it.

One of the things I felt was that sculpture in public places has to change its aspect from time to time to have renewed interest, renewed experiences. If I could use the weather, or a planting, it might be a way of maintaining this interest. Here you see the sculpture in the summer. The grass grew slowly inside the Cor-Ten. The problems were extreme in getting the grass to grow. We had to add inside drainage. It did, however, begin to work and to develop a life of its own. always staying within the form.

I mentioned I thought that the sculpture looked enormous in the factory. When I put it up, however, it did not look big enough. Scale is a problem in outdoor sculpture. That which appears monumental can totally change the moment you get it under huge skies.

Over a period of years, I kept adding forms. You will see by the color of the trees that the slide on the left was done in the autumn, the one on the right the following summer when I added two elements. Here is a detail of the hillside a year later when the grass finally assumed its proper color.

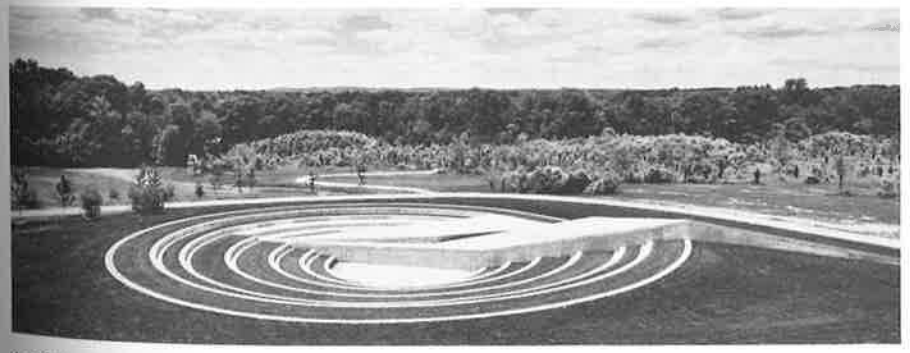
Here is a sculpture that I did many years earlier, where the grass is actually a reflection absorbed into the sculpture, exactly the first concept using an illusion to complete the work.

However, reflection did not give me what I wanted. What I wanted was for the work to alter continually by its own history and the events moving around it.

Next is a sculpture that I am working on now, a project at A.T.T. Long Lines Headquarters, outside Bedminster, New Jersey, a very affluent area. It is in a rural setting, an area where the public is very concerned about anything disturbing their "horse country." It was difficult to get the people to accept any construction. The building is hidden from the highway and carefully supervised by a citizens' committee. I was asked to make a sculpture, to create something from the existing natural landscape and human environment that would not only be an aesthetic experience for the people living in it and working in the area, but be almost invisible and yet give some kind of added dimension to both man and nature. It was decided to build an artificial lake. I always wanted to make a sculpture you could walk on, over, under, and experience thoroughly. What they came up with looked like a little Japanese tearoom. So we got rid of the lake! I decided that if they wanted something for an isolated rural company complex where people were habituated to urban arts and amenities, we had better come up with something that would satisfy the human element within the restrictions. I thought I might create a sculpture that required planting at different seasons. I thought it would be fun to use corn, wheat and barley, and have the people enjoy changing seasons within a new aesthetic experience. The only constant was the lines that you see in these slides which would be the steel structure. But after considering it very carefully, I realized that they were in a very beautiful rural area, and why compete with the landscape? I thought, then, I might give them something that would bring them out of their buildings for a collective experience, allow them to bring their lunches outdoors, become involved with, enter, sit, and walk in the site—and to meet with others, be in groups, or be alone and withdraw in silence.

The material is poured concrete and planting which have the seasonal changes I talked about. It will be covered with snow at some point, and then change in color as the seasons go along. I am in the process of doing this piece right now. Here is the hole in the ground, and, once again, there are drainage systems along with the problems of the texture and color of the concrete to work out.

I am also finishing an N.E.A. project, a sculpture for Dartmouth. Dartmouth has exactly the same problems that A.T.T. has in that there are groups of people in the same place every day, and, at least at Dartmouth, they stay for four years. I am trying to do a piece that would be an experience in terms of walking around, under and between the sculpture, but also in consideration of the climate. After three or four visits to this part



AMPHISCULPTURE

Beverly Pepper

of the States, I realized that it was no accident that many of the buildings in New England are white. The color of the sky and the whole sensibility of the air calls for a sort of white architecture, so I made my sculpture white, particularly when I learned that there is snow at least four months of the year in Dartmouth. I decided that it would be interesting to do a sculpture to be set below ground in such a way that the sculpture would disappear when it snowed and re-emerge in the spring, almost like a planting. As you see on the left slide, the sculpture is below ground level in a bowl. It is linear on one side, and solid on the other. The sculpture also has an inner life, as well as an outer life. The slide on your right shows you how I have resolved the problem of the internal structure, which I wish to become evident and *experiential*. Since the sculpture is about fifteen feet high, it can be walked under and down into where the interior is about ten feet high. Here it is under snow, giving you some sense of its disappearing. I have put this slide in to show you the continuity of illusion. The one on the left is an early sculpture done in 1967 where I used both the linearity and the grass being absorbed by the sculpture as in the Dartmouth piece. This work shows the sculptural reality of the steel as opposed to the side sculptural reality of the grass which is dependent upon the environment in the sense that it will change with the seasons.

This project, done in 1971, is about the use of sand as an integral part of the body of the sculpture. It was conceived at the time of the Dallas Land Canal, the difference being that the work changes with the shifting winds. It could have been an island or a wheat field or a hillside, but what I was interested in at that point was sand. I had to become involved with the study of wind probability, to keep the sculpture from disappearing completely. It was a problem that I worked on with many technicians. We solved it, more or less. It was exciting, because being almost uncontrollable, it had incredible challenge!

THE MAJOR RITUAL Beverly Pepper

This is the sculpture in front of the New Orleans Museum, the one that I have been putting up during the last few days. Many people have asked me how I moved the pieces from my studio. I thought it would provide an interesting closing to show its being put together for shipment. This is how it left and that is how it arrived. Here it is in front of the museum.

Today, man and nature may appear in conflict. The battle now is between a life-size environment, the over-life-size natural elements themselves, and the sculpture which represents man in the battle. My intention is to use public sculpture to aid in resolving the conflict between man, his man-made environment, and nature.

SLIDE PRESENTATION

Constantino Nivola
New York

When painters talk about space, they usually mean large canvases. Is that what we sculptors mean by monumentality? Just large size? Big sculptural forms? Size may be one aspect of monumentality, but it is not the central factor. Many large-scale sculptures, temples and buildings, ancient and modern, somehow persist in feeling rather small, while some structures look large and monumental. The Abu Simbel Temple in Egypt, a massive affair indeed, strikes me as a banal, commercial edifice, not worth the tremendous expense of saving. Michelangelo's *David*, in Palazzo della Signoria, a piece of considerable size, lacks the proper scale, even in this context. But a much less glamourous bronze figure by Donatello standing nearby, seems to capture and hold one's attention. The sculptor, Giacometti, has speculated a great deal on the question of size. He concluded that permissible limits were in the range of from one inch to a maximum of nine feet. Above that point, he stated, a sculpture looks monstrous, and so he refused a commission to undertake a large work for the Chase Manhattan Bank in New York.

The "pop" artist's proposal of enlarging certain common objects, like a hammer, a pair of scissors, or a McDonald's hamburger to an absurd scale is an irrelevant exercise. It seems to me that a sensitive understanding of the right scale, related to man—the human scale, to use a phrase that is more often maligned than it is understood—is essential to the sculptor, just as it is to the architect. A knowledge and sense of proportion is, in the articulation of a form, an essential ingredient in dealing with monumentality. The problem of appropriate scale has long occupied politicians, political scientists, and urbanists who have been concerned, for example, with the concept of optimum size for communities. Sculptors, whose works appear increasingly in urban physical environments, also need to reflect on the issue and not simply assume that as the skyscrapers get taller and more imposing, so must the art.

Let us start with the slides, please. This was a project for a memorial in Corregidor, one of the first islands liberated during the Second World War. The concept was to sculpture the entire island, creating a variety of architectural and sculptural events.

This is another memorial, dedicated to four chaplains who gave their life preservers to the soldiers and sank with the battleship in World War II. The form is meant to evocate the sinking ship, the four standing relief panels joined together symbolizing the gesture of the religious heroes. The memorial is located in a private cemetery in Washington, D.C.

Another model for a memorial to a political hero is in Sardinia, Italy. It is an environmental form symbolizing the prison where he died under the Fascist Regime, and the house in which he was born in Sardinia. The visitor would experience the feeling of participating in the drama of the man by entering inside the monument through a small door, compelled to bend down in a gesture of reverence, to find in himself first-hand witness of the suffering and dignity of the subject.

This plaza in Sardinia has one of those shapes that came, not from determination of urban design, but by chance. Like many of the best plazas in Italy, it consists of granite paving, large granite benches, with an intervention of rocks from the countryside. The plaza is dedicated to a poet, and in the rocks are placed small bronze sculptures, portraits of the poet in different attitudes and states of mind:

lawyer, Socialist, drunkard, and family man, all to be discovered by the visitor going about the plaza. This is a view of the paving and some of the benches showing the standing rocks. All the houses surrounding the plaza are painted white, trying to establish a relationship between the forms, the benches, the windows and the general accidental architecture of the buildings around the area.

Here is a graffito wall with a sculpture fountain in a recreation area in one of the city projects in uptown New York City. The colorful box of flowers was added by the people. Though they liked the project, they felt that something was missing and tried to embellish it a little more. There are also playground forms and free-standing sculptures, as the cast horse where the children can play, shown here against the background of the graffito on one of the walls. At one of the entrances is a freestanding wall, sculptured on both sides.

This is the back wall of the auditorium of a public school in uptown New York City. I approached this problem by articulating the entire wall, placing small sculptured forms projecting from it in an orderly rhythm.

This is a war memorial consisting of a panoramic sculpture in which the visitor could go through the form and experience it as if being involved in the drama of the soldier.

A family memorial in my hometown, Sardinia, consists of flat sculptures placed horizontally with two small bronze sculptures. Wheat is planted in the spring to grow around the stone forms.

An exhibition of my sculpture in my hometown took place in 1957, using the town as a setting for the sculpture show. By coincidence, architect Eerro Saarinen asked me to do the sculpture for the campus at Yale which involved the same problem, sculpture in the role of creating an atmosphere in an architectural context. This is how the same pieces looked in the context of the spontaneous architecture of the town. Not large sculptures, they were simple forms around which the children would play and to which the people in general would relate.

This project was, in my opinion, a serious attempt to come to terms with the subject of sculpture in architecture. By trying to recapture the atmosphere of the old days in the time of the cathedrals, when the sculptor worked with the mason using the same materials and tools, the sculptures were made with the same cement and forms that were used in making the building, and placed while the building was in process. One keeps finding the sculptures as he moves through the campus. At one of the entrances is a sculpture high on the corner leading to a passage that divides the two campuses. The architecture reminds us of the medieval towns in the hills of Toscany, Italy.

In this public school a group of concrete sculptures are arranged around

YALE UNIVERSITY Constantino Nivola

a building. The whole building is in concrete, the same material used in the sculptures, so that their presence is not meant to stand up independently, but rather they are a part of the building. The sculptures were

PUBLIC SCHOOL Constantino Nivola

the building. The sculptures were carved from a block of concrete before it was completely set. It is a commonsense technique, consisting of pouring a block of cement and waiting a few hours until it is firm enough.

This is one of the relief murals that I did for the McCormich Exposition Center in Chicago.

This facade of a building in Hartford, Connecticut, is the largest piece I have done. It is 130 by 30 feet. The sections are installed like ordinary pre-cast units.

The technique of casting in cement on sand molds first consists of filling the sand mold with liquid cement to preserve the shape. Afterwards, a mason uses a trowel and applies about one inch of mortar, following the forms, and reinforcing the aggregate cement which is usually poured straight from the truck. The sand is shaped with simple tools, mason tools, usually. Sometimes, if a layer of a different color of sand is applied in the shaping of the form, it will appear in free organic veins or strata of color which give a natural look to the final appearance of the relief. Inserts for the hanging of the piece to the building are embedded in the pieces.

This graffitied free-standing wall is part of my outdoor garden in Long Island. It records the play of natural light. The roughness of the engraving provides this expressive line. The painted wall creates a sympathetic space for outdoor living. Myself being the client, I can afford to paint them anew every year. Here is a solarium for sun-bathing all year round for which there is no conventional entrance. One has to climb in by ladder from the outside; however, there are steps inside.

This is a detail of a model of a sculpture done for the Olympic Games in Mexico City which Mathias Goeritz showed in his slides with flattering remarks for which I am grateful.

I hope this will be of interest to the art students. It was a sculpture course I gave at Harvard on form from drawing of three-dimensional forms, looking at a still life consisting of common commercial objects as models. The student was encouraged to see and discover first, the relationships and continuity of line, then his translation on a relief, modeled in sand. In this slide are shown three-dimensional forms discreetly polychromed, confronting the model from which the forms were derived.

The final subject is the redesigning of Times Square, done with the aim and intention of retaining the character, the fun of this area of New York City. Using sturctures of wire and plaster, the students made model forms proposing different solutions such as redesigning advertising billboards and creating space for people to stand and walk before, during intermission and after attending the theatre. In general, they tried to make the area more human.

The confrontation of the appearance of accidental reality and the aesthetically organized work of art is all very revealing. A device I apply after seeing an art exhibit is if the

reality of life strikes me as vital and meaningful, it proves that the artist has failed. On the contrary, if the reality of people, cars, and buildings appear vague and undefined, then the work of the artist stands up unequivocal in its form and its content.

INSURANCE COMPANY BUILDING

Constantino Nivola

SLIDE PRESENTATION

George Sugarman
New York

I was told that I would be the anchor speaker, and I did not know what that meant until I realized it was a euphemism for being last, which means I may have to rush a bit. But hearing Pepper and Nivola made me realize that all of us are approaching and are concerned with the same problem. What do we do when we put things outside, when we are suddenly approaching not merely a different aesthetic problem, but a social problem? How do we pull the two things together? My approach has been different, perhaps because I started at a time when American sculpture was becoming extremely fertile, extremely important, and our concern was with extending the formal vocabulary. I think that is one of the wonderful things that we have now. All of us, students and those of us who helped develop these new ways of, let us say, talking, have a tremendously rich field from which to draw and with which to bring our sculpture to the public, to people who are not particularly interested in art and to allow them to experience what we hope to make them experience.

I am going to start with two of the early wood pieces. Looking back, I think it is interesting that out of very formal concerns, there has been continuity with a constant development toward the public concern, and right from the beginning. Though I may talk about just the formal aspect of it, there also has been the concern about the sculpture as a metaphor for other things. Let me get right to the slides themselves.

This is called *Inscape* and was done about twelve to thirteen years ago and was one of the first, if not the first of my sculptures which existed in relation to the floor. Most sculptures one has to look up at. It is overbearing. I wanted to see what would happen if a sculpture came out of the floor, so to speak. I was always concerned with what sculpture was. I felt sculpture was somehow an extension of the human body; that we relate to sculpture in terms of our intuitive sense of our body in space, and I have always been concerned with sculpture as a three-dimensional experience. Of course, this piece did make you relate to the work of art in a totally different way. You had to bend down and, in a very elementary way, it became a kinesthetic experience. I remember when I first showed it; it was a very difficult sculpture for a lot of people. People literally laughed at me. They said it looked like it fell from the ceiling, and that it was a miniature golf course. But we became sophisticated very quickly in those days, and when I showed it again, oh, a year or so later, in a big show, people began to understand that it was an attempt to find some other kind of formal unity.

One of my interests was using a diversity of forms which were separated and individualized by use of color. Because one of the distinctive things about my work is the color; the color is only another tool for making this kind of formal statement, perhaps for separating, joining, energizing or revitalizing a particular form. I needed color, as very few sculptors needed color, to achieve what I wanted to do.

Those of you who go to the recent Whitney *Bicentennial of American Sculpture* will see this piece. I chose to put this in the show, and you will notice that the elements have pulled much farther apart. It is a piece that, to a certain extent, can be changed depending upon the spatial context in which it is set up. This is one of the things that I like about the piece. I always want you to get different views when you walk around the sculpture. Even in the kind of sculpture that we call the single object

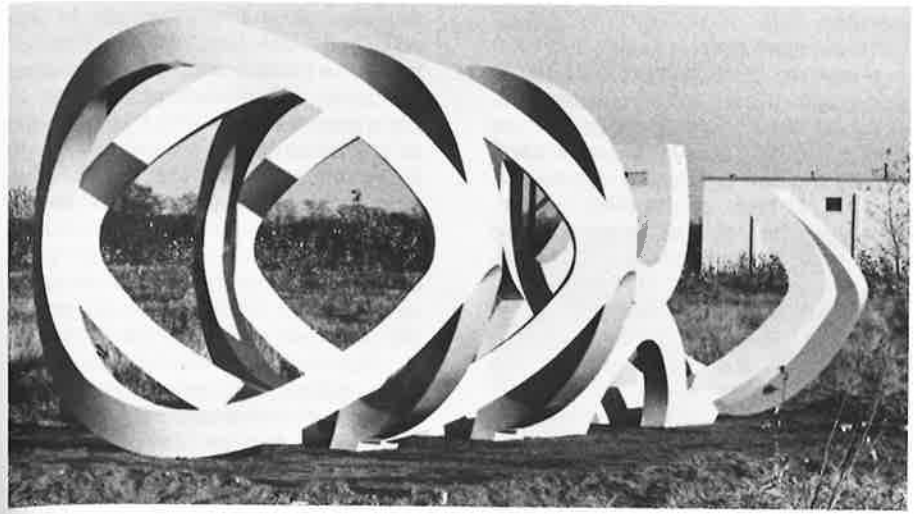
sculpture, which I am not showing here, but will later on, I felt that the spectator should be rewarded with a different experience if he went around to the so-called "back" of the sculpture. Now, this is a very big sculpture. Both of these sections are in wood. This is probably the most impractical sculpture ever made because of its two lines of 24-foot forms. It was a sculpture that was meant to go on and on. It filled up my studio, and that is when I stopped. I literally stopped when I got to the window. I had to photograph it outside, but it is not an outdoor sculpture, obviously. It shows another of my concerns—extension in space. We are very much concerned with: When does a sculpture stop, when does it start, when and why does it end? This is perhaps the most extensive, if I may use that word again, application of my idea of different forms which, when they are perceived—which you have to do in your head—will make a unity of a different kind than the "single object" kind of unity that most sculptors of that time had. Roughly speaking, one line is more geometric in form than the other, which is, let us say, more free form. You see the various relationships to the ground and to the vertical space. One of the important things to me was that I became very interested in the shell form, that is, the interior volume which was defined by a relatively thin exterior form. That has since been a constant concern of mine, particularly in metal sculpture. What happens to the inside? How do you make it interesting? How do you get people involved with that kind of sensation?

I am jumping quickly to one of my first big outdoor sculptures. This is outside the Xerox factory in Los Angeles. It was made from a wooden model which was roughly one-half the size. You see, all of the open forms are now seven-and-one-half feet high. The forms are quite separated and spread over an area about thirty-feet square. People have to walk through the forms as they progress from one into the other to see the continuity which I put into the work. What was interesting about this is that it was done roughly about seven years ago and, in terms of fabrication, some of the forms could not be made in the United States. I could find no one who would attempt to make that white form, because certain changes take place on the outside and within the inside volume. To have it done, I had to go to Europe where there are more specialists who have more patience and time. Now, of course, I have all my work done in the United States, and I know enough, myself, to even direct some of the operations. I should say that practically all my work is done by Lippencott in North Haven, Connecticut, which is the only company that does only metal sculpture. We work very closely together. You will notice that the sculpture is not too tall.

I hate the word "monumental" sculpture because it seems to me that it is something that implies being overbearing toward people, something that is not approachable to them. When I have a lot of space in which to work, I like to bring the sculpture to human dimensions. I do not try to compete with the architect or architecture. I do not try to blend the sculpture with the architecture because, if possible, I think it is and should be a separate, although parallel, experience. But I want it to be related to the human scale.

Coming from the interior volume, I asked myself, how do I define that in terms of a line? Do I need the whole form covered? While this is a fairly heavy line, the thickness of each form is ten inches. It is not too heavy in terms of the total size which is over thirty feet long, nor is it too high.

This is a sculpture that was not done for a particular space. Since commissions do not come every day, I work out ideas by making models and this one was commissioned from a model. It was eventually placed



TRIO

George Sugarman

alongside the pool in the New Empire State Mall in Albany, New York. You can walk through this sculpture, and when you get inside, you actually experience the tremendous volume that these linear forms create.

This is a very large sculpture done from the architect's drawing for a bank in St. Paul, Minnesota, before the building was up. I was asked to do a sculpture in a very unusual space above the arcade that leads into the bank building, through the glass doors. It is 45 feet long by about 33 feet. Between the beams, it is 17 feet high. I said to myself, "Finally, I have a space in which I can make each form really a separate, individual sculpture."

I had the problem of working with an architect who was totally hostile to the project, and when I saw the model and the drawings of the building, I realized that I had nothing to work with, nothing at all. It was a "rubber-stamp" building. (Laughter.)

You laugh, but it is not funny. It happens often, unfortunately. So, I said, "Well, I have this space which is, by the conditions of the Commission, above the people's heads. Why don't I just make my own little dream world and carry out my ideal, beautiful sculpture?" That is what I did, telling myself that people would be going through this space day-in and day-out over the years, and I would give them as rich an experience as they were able to take. I began at this time to grapple with the problem: "What does public sculpture mean to the public?" I started, as I do with most of my sculpture (at that time, especially) with what I called a "seed-form." Out of that seed-form, I would develop all the other forms, giving a certain kind of continuity to all the variety of forms that I used in a piece as extensive as this. I used this slat form, combined with the blue, drum-like form, which gave me, of course, angles and circles. It is as basic as that. Obviously, on the other side, the color is different because the light conditions are different as the sun hits it on various sides.

This is an almost impossible sculpture to photograph, not only because of its size, but also because of its position. However, this gives you an idea of what it means. I told myself that although this was above people's heads, it would not be overbearing; it would not overpower them. I wanted this to be as light and as open as

possible. Of course, my work is all light and open now. It took a tremendous amount of aluminum, (enough to make a jet plane) and yet, there is no sense of that at all. Because I knew that it would have to be re-painted, I kept the forms as open as possible. In fact, as soon as the piece arrived, it had to be painted because it had gotten so filthy from the trip. The painters just climbed up through it, and there was no problem at all of getting it cleaned up. Therefore, the openness of the forms works in a particularly practical way also.

This piece, as you can see, was derived from the slat and the circular forms with which I started. For many people, it is a extremely difficult sculpture because they themselves have to pull it together. I have received various reactions, from "It's a tremendous major piece," to "It's just a lot of junk." The sculptures are each 17 feet high. Each one of them is a major sculpture, so to speak. Looking out against this light sky, they are almost a silhouette kind of a form. As you come down the escalator from the second floor, the sculpture unfolds under you, and it is one of the best and most exciting views of the sculpture. In a sense, this sculpture is the very opposite of the one I first showed you. That was a floor sculpture.

This is treated as a ceiling sculpture. Of course, again your body has to change its position to look at it. It is a diverse sculpture and a very rich sculpture. It took the Lippencott crew about nine months just to fabricate the piece because it was so difficult and so unusual in terms of its demands. That is the longest that any of my pieces have taken to be fabricated.

Now I will show you a different type of sculpture, a vertical form, but still using different forms on the bottom and open kinds of forms on the top. It is 18 feet tall and is now in some business center in Brussels, Belgium. You see how the color not only helps me activate the space, but, I think, it makes it more accessible to the general public. I do not believe color is the only way of doing this, but it does articulate the forms, increases the sense of volume and the kind of activity and energy that I want to get in my sculpture. You can walk into the sculpture and climb on it; it has been done. It is something you can expect when you open interior volumes like that. I want people to experience my sculpture in that direct physical way. It is an invitation to get out of the museum and into the sculpture.

This is another vertical piece that is being done right now. The model is about twenty-five feet high. It is a rather recent piece and a deliberate attempt on my part to make something more emotional, more lyrical, and much freer—to get away from a kind of formalism that I felt had been entering in my work. It is one of those fortunate experiences for me, a model that was done quickly and spontaneously. I should say that I now work in cardboard models, and then those that I like, I have done in model size and eventually in full size. This one was done by me in about a day-and-a-half. It was just a very spontaneous thing, coming out of all the thinking I had been doing about how and where I wanted to take my work. I do think a lot about that problem. You see that it is quite diverse and very informal from every side.

I feel that getting back to a certain—well, I don't know if it is getting back, or going towards—informality is one of the fruitful ways that all art can go nowadays. We have gone through a great deal of formal, nonvisual and intellectualized art. I think that to get back to the experience of art now, without getting rid of any of the intellectual content and experience that we know can be in it, is one of the important steps that we can make. This is one of my declarations towards that end. As you notice, I talk about the work in a more formal way because those are the concerns of the period that I came out of and am still with. I think a work of art has to have, no matter what its ultimate aim, a formal concern. That is, its backbone. The formal concern is the artist's concern as well as the elitist's and specialist's concern, but it is not necessarily the concern of the general public. The problem facing the artist today is how do we work both levels?

I want to get to the aspect of how we work both levels. This is a model of a rather extensive sculpture for a school in a fairly small town in Germany. It has never gotten beyond the model size because of finances. It is pending. It was approved a few years back, and then came that recession. The work is still approved, period! I gave myself the problem of giving it unity by carrying this first form in a diversity of versions throughout the whole space, enveloping and extending so that the whole space is activated. As people walk through it, they can get the sense, which they have to perceive as an experience of these diverse forms. Of course, since it is for a school, it is meant that children should be able to climb and play on it, or perhaps just walk through it, if they want to. This was my first serious attempt to work in terms of what I thought would be forms where people did not have to worry about experiencing art. They could just experience it. Too many people of the general public are worried about art. They either feel inferior and say, "Oh, I don't give a damn about art! What do I care about it?", or they are put off by it. If you have a kind of piece, which is in the ordinary use of the word, "monumental," it really pushes them away from the object. I feel that it is possible, with all that we know about sculptural forms and sculptural possibilities, that we can work on both levels satisfying the elitist's aesthetic demands of volume, space, rhythm, color, relationships and all of those other aesthetic demands that you might make. Yet, it needs to remain on a level that the ordinary person does not have to say, "Oh, this is a work of art. I don't know anything about it." The general public, I feel, does not have to know anything about art. They do not even have to know that they are experiencing a work of art. Just let them experience it; that's enough. That is the problem I attempted to deal with in this piece.

BALTIMORE FEDERAL G. Sugarman

Many years separate the next slide from the last one. This is the model that is in the G.S.A. show for a Federal Court House in Baltimore. I will not relate my experience with the judges; Beverly has given you hers, and that is just one sample. I had an extensive space to use. It was roughly forty by fifty feet. The model has been approved by the government, so I will just talk about the aims. This is not only a Federal Court House, but is also a community building. It is used for school childrens' innoculations and other purposes. The main courtroom has projection booths, and it will be used for childrens films. It will also be an immigration office. Thus, a great diversity of activity, in addition to the sentencing of criminals, will take place in this building.

I had a totally different experience with the architect than the one I mentioned before. The architects were part of the committee which chose me from among the various sculptors being considered. But I did not know that;

I had not spoken to them at all before I submitted the model. After I submitted the model, I did go down and see the building just to get some idea of the spaces so I could work with that in addition to the architects' drawings. After I submitted the model, I had a chance to speak with the architects, and it was amazing that we both spoke of our work in exactly the same terms. We spoke of it in terms of humane qualities. They wanted their building to be open to the public, for the public to feel that it was a hospitable place for them to be, and one in which they could wander through and have different points of view. That was just how I was talking to myself when I did the sculpture. I kept saying that this is a "people" sculpture. If it is in relation to a courthouse, one of the purposes of the building, I want the sense of the humaneness of the law, not the negative sternness of the law. I want people to see the ideal aspect of the law's stability in its relation to them and to the community. This kind of thinking influence the forms that I eventually came up with, the open dome-like structures which, as I said, would be about forty by fifty feet in extension.

While it will be above people's heads, they will not feel that it is out of touch. There is also an obvious analogy to a bower, and I feel very good that I am mature enough to use a form that has some kind of association like that. When I first started, I struggled; I can not explain how hard, hot to have any associations at all. Of course, now I know that this is impossible. There is no form that someone is not going to say, "Oh, that reminds me of Grandpa or Grandma, or the day I was on the lake, or something like that." But now I feel that it does not matter. I can use all those things and use them with all the formal intent I want—the metaphorical intent I want in order to make the sculpture approachable on various levels. This sculpture will be placed in front of the building, back from the street a little bit. The street rises up where the traffic is, so that it will be seen from underneath, which will increase the sense of openness and relaxation that I am sure will be communicated when the big piece is finished.

In terms of fabrication, the development of the form, as shown in this piece, is also interesting because it is made up of essentially small forms, some of them repetitive, others, quite different. All are just welded together. In terms of transportation, for instance, it allows the sculpture to be broken off at any point and put together on site with much greater ease than when you are working with one big solid form, the kind, for instance, that Beverly had to deal with in her piece downtown New Orleans at the park. I feel it is interesting that the aesthetic form and the practical problem of fabrication and transportation, which you always have to deal with, have also come together in this piece in addition to the aesthetics and the social aspect. Now, whether that is just fortuitous, or whether they would have come together inevitably, I am not sure. The red form, which rises to about eight feet, is exactly the same form that runs through and creates all the benches. It goes up and down, and it is kind of a repetition, a coda of the whole rhythm of the sculpture as it rises and falls and rises and falls. The bright color picks it up and gives it a little lift at the end and, of course, activates all the other color in the bigger forms.

Thank you. I guess that is all.

MONUMENTAL SCULPTURE RELEVANCE: AESTHETIC, SOCIAL, ENVIRONMENTAL

Roger Bolomey, Moderator
Mathias Goeritz, Mexico
Hilton Kramer, New York
Robert Mallary, Massachusetts
Isamu Noguchi, New York
Beverly Pepper, New York
George Sugarman, New York

ROGER BOLOMEY:
My first question is addressed to Hilton Kramer. Hilton, how relevant to today's society is monumental sculpture in contrast with bygone times?

HILTON KRAMER:
One has to face the fact that our culture is completely lacking in any significant conventions governing the whole idea of monuments. We exist in relation to the idea of the monumental expression in a totally different way from closed societies, or closed cultures in earlier historical periods, which principally through a nonaesthetic means, enjoyed a fixed concept of what a monument signified and its function within the religious and political structure of those cultures. As I understand our own society and culture, we no longer have that fixed notion of what a monument is, what it signifies, what, in a sense, it can do for us. I think it is a characteristic of an open and democratic society that you cannot have that kind of notion of what the monumental signifies. This looms as a greater problem for what monumental sculpture today can be, or should be, than it ever loomed for monumental sculptors in the past. I am going to have more to say about that this evening, so for the moment, I will end my remarks, except to say that I would be suspicious of the work of any sculptor entering into this area of the monumental, who did not begin with recognition that it was a problematical concept.

BOLOMEY:
I should like to ask each panel member, starting with Mathias Goeritz, if the term "monumental" is a correct term? After all, when we talk about large sculpture, we could be misled by our knowledge of the past. Is monumental the correct qualitative word to use?

MATHIAS GOERITZ:
Probably not. But we want to understand each other, so that we know what we mean. Monumentality, the idea of monumentality, means an inner strength which many of the sculptures seen today do not have. The *Curtain of Christo* does not have the Kuros feeling of the Greek sculpture, which had been the basic idea of eternity. Very few sculptures today have this quality. But there are still people who try to achieve it. I often think of the *Franklin Delano Roosevelt Memorial Competition* in which perhaps two hundred artists took part, making different propositions. Anyhow, we know what we mean when we say "monumental," though the word may not be precise, especially if one relates it to the "monument."

ROBERT MALLARY:
I think there's a great deal of ambiguity about what the word, "monumental," can mean in our culture. It could mean something simply vast in scale or it could mean something that has grandeur that implies some values. I am involved with a project at this point in which these vast tracks of land that have been surface mined are being put back and reshaped. This is called "reclamation," but possibly it could be called sculpture. It is certainly monumental; it is certainly environmental; and it is public. I think a great deal of the question concerns what we can validly call sculpture these days. In other words, the basic problematical question of what falls within the sphere of sculpture these days can be translated on to a monumental scale; then it becomes

a monumental problem.
BOLOMEY:
George Sugarman, what is your idea on the word monumental in sculpture?
GEORGE SUGARMAN:
Well, as I just said in my talk, I dislike the word intensely, perhaps because when I grew up a monument was not something big, it was something overbearing, something that was supposed to impress you. It was a monument to somebody, or to some idea; I doubt that there are many people who have any heroes anymore. I think we live in an age when perhaps we are looking for heroes, but I think most of us haven't found very many. Certainly, it is a pluralistic society. If I might have a hero, many other people will have perhaps different heroes, if any at all. I prefer to use the word "public sculpture," or "sculpture for outdoor spaces" and terms like that, leaving it as open as possible, in terms of its meaning, its possible relationship to the public and what the sculptor might do about it.
BOLOMEY:
Hilton Kramer, you said something before about this. Can you make a short statement relative to the use of the word monumental?
KRAMER:
Oh, I think the use of the word cannot be avoided. I agree with the kind of distaste for it that George has expressed and agree that it also relates to this notion of monuments and heroes, which is something else that I am going to speak on this evening. But, to drop the use of the word is simply to evade one of the dimensions of the problem. If you create a sculpture beyond a certain dimension of scale (and don't ask me what that dimension is) you are in the realm of the monumental, whether you want to be or not. Then the question becomes whether or not you are going to control what is signified.
ISAMU NOGUCHI:
The word "monumental" has a certain pejorative implication which none of us likes, but we do know when a thing is big or small and that there are things which are appropriate to be big, but the appropriateness really stems from its relationship to its environment. I mean, there would not be much point in making a monument indoors except if you want to make it look really big. Then put it inside a gallery, and it will look really big or monumental. If you make it within the context of an interior, and if your concern is not to make it look monumental but sufficient and relative to the people or the room, then it may not have to be that big to be appropriate as a sculpture. Everything to me relates to the environment: the area that you consider to be a part of whatever you are working on, the size of the people who are looking at it and the size of buildings. All those factors make up the definition of size that many people might call monumental. But I do not think that sculptors care whether it is monumental or not.
BOLOMEY:
Beverly?
BEVERLY PEPPER:
Well, it is very hard because everybody said something that is absolutely correct, and therefore, the problem is really one of intention. After all, Hilton's description or definition of monumental (which has to do with a monument) is very difficult to handle in terms of what George said—that we have no heroes anymore. Certainly the sculpture that I am making for the Federal Court Building, which by definition of size, is monumental, is certainly not a monument to the federal court system. I think we do have to re-define the word in order to discuss it properly at this moment. Isamu's relationship to monumental is more or less what I feel, and I think what George and we all feel. It has to do with the environment, the public, the responsibilities both to ourselves, aesthetically, and to the public, aesthetically. We have to consider this only as a secondary, but very important, attitude because once you make public sculpture, you must worry about the dangers involved—where the sculpture is going—all very practical things but secondary to the aesthetic. When you make a monument to something, you ignore everything but your hero. Before we can go any further with this discussion, I think we must define the word "monumentality" the way we are going to discuss it further.
BOLOMEY:
I find it rather important, not for us as sculptors, but for a public that is sometimes confused by what we do. We may not have to be concerned with definitions, but when we talk about a contemporary monumental sculpture as just defined, we mean large sculpture.
UNIDENTIFIED:
Placed in a public situation.
PEPPER:
Well, Isamu said that the sculpture could be indoors, very private and have a monumental attitude and aspect. So I think, Hilton, it is you who will have to define monumental for us, because you are the one who now would change our approach to the subject. All of us before would have said monumental is a sculpture in public places—and big—not just in size but in attitude.
KRAMER:
Well, I am not sure I can define it, but I think I can characterize the kind of response that any large-scale sculpture in a public space elicits. That is, it elicits a feeling of significance beyond the aesthetic by virtue of its occupying a public position. I think it does that whether the artist wants it to or not. By virtue of its public place, it seems to say to the public that it means something beyond itself. We are quite unused to this for understandable reasons. We are all modernists in that respect. I think we are much more comfortable with works of art that do not ask us to respond to them as signifying anything beyond themselves. A large-scale work placed in a public place does seem to invite us to a somewhat more complicated response.
PEPPER:
But all of us discussed at one point, and this was before we got on camera here, the experiential aspect of public art, which does not mean that we are substituting experience, and emotion of experience, for the responsibility of grandeur, which is what you are really saying, but . . .
KRAMER:
It is one of the things I am saying . . .
PEPPER:
You might say one of the things you are saying, but I think that if we can discuss the experiential aspect of it, which is what the public is getting at least from most of us who work here, it means that they at some point or another have an emotional feeling. After the first projection (which almost always happens), there comes the possibility of slowly relating and reacting. If you tell the public it is a monument to something, they first have to decide whether or not they wanted the monument (the Caesars did not ask). We are not asking either, but we will be asked if we say that it is a monument to something in times like we are living today. Don't you think so?
SUGARMAN:
I think Hilton raised something interesting, if we could pursue it. You say that the sculpture, the outdoor sculpture, public sculpture, has something else added to it by its place. But all art, we say, has something beyond just the physical object. That is why it is valuable. It transcends itself. If we could define the difference in that "something else" from the gallery or an enclosed place—the public object—we might get closer to, "what is this something else." What is monumental and public art? What is added that is different from what we expect the transcendence to be of a physical object in a gallery or museum?
NOGUCHI:
If I may say so, there does seem to be such a thing as something being monumental or we would not be talking

about it. It is a term that has come down to us. It refers to something that is other than just being big. For instance, I think of the Washington Monument as being a monument. I don't think of a field of corn, of a mountain, as being a monument—which takes care of Mr. Mallary. I mean, he can go as far . . .

MALLARY:
Unless we speak of "monumental mountains." (Laughter.)

KRAMER:
Can a mountain not be monumental, Robert?

MALLARY:
That is a significant point. If I have grasped it correctly, I should like to take it a step further by pointing out that a distinction should be made between a monumental work of public art created for an urban environment and a work of a comparable scale and conspicuousness placed in a natural setting, say in a rural agricultural area or in a remote wilderness. Whether or not such a work harmonizes with the natural environment in which it is embedded, would seem to suggest—even symbolize—a philosophical attitude towards nature and our place as human beings in the natural scheme of things. While one attitude is deeply exploitative and manipulative (many earth artists are guilty of this approach) the other seeks an expression of harmony and humility in respect to nature and the ecosystem. The underlying attitude is particularly crucial to any form of earth art or environmental sculpture in which nature itself becomes the medium of expression.

KRAMER:
May I ask a question about that? I have never had an opportunity to ask a sculptor interested in this realm. How is it possible to decide, in a way that satisfies you, if you are able to add something to this natural phenomenon that is in some sense an improvement? Take mountains, for instance; we have just been referring to them. Somebody said something about a nonmonumental mountain. If it is a nonmonumental mountain, it is really a molehill. But you see that mountain, and what could you possibly do to embellish it, improve it or articulate it, that nature has not already done for you? I think that is a much greater problem with earth art, or whatever it is called now. A problem the artist themselves have not been able to bring themselves to recognize. I mean, there, God is the great sculptor.

MALLARY:
I disapprove of sculptors attempting to compete with God, nor should they carve into and mutilate mountains as if Mother Earth were just another medium for sculpture like plastics or steel. But owing to the critical need for expanded energy resources, surface mining and reclamation are going to spread whether we approve of the idea or not. As a sculptor whose concern for the mounting environmental crisis goes back at least twenty-five years, I cannot help but ask: what form is this reclamation to take? As a sculptor I am concerned with the sculptural quality of the topography and landscaping fo the forms that replace the original configuration, and as an environmentalist, with whether these forms have been designed to resist erosion and to harmonize with the total visual scheme. If concerned sculptors and designers fail to become involved in reclamation, others, far less competent and less sensitive to aesthetics, will have it all their way. In fact, this is mostly how it is at present. It is worthy of note (especially in this gathering of sculptors), that the authentic earth artists in this country—which is to say, those involved daily and on a vast scale in reshaping the earth—are the bulldozer operators and their supervisors responsible for creating the topography of reclamation (some of whom, it should be conceded, are doing a rather good job of it).

SUGARMAN:
You are proposing art as a kind of salvage operation, then?

MALLARY:
In a sense

KRAMER:
As a sort of coefficient of conservation.

PEPPER:
I am neither involved in what Mallary does nor am I involved in land art, but I do think that a central aspect of art is the seeing eye, and Mallary's reclamation, as you call it, or whatever he is doing (the altering of the mountain, or the artist's intrusion in the mountain or in the water), has to do with re-awakening sensibilities. It is not altering the mountain so that it is less or more mountain, but it is another kind of experience. It is simply having the eye see beyond what the picture post card has given it. This is my understanding and my experience with any kind of land art. I think that using reclamation as a base, is no different than taking an empty canvas, or a lot, or anything else, and reconstructing something with that canvas.

SUGARMAN:
No, what I meant by that comment was not to be ironic, but to say that a special part of the problem is that very few of us will do it, even if we wanted to do it. How many pieces of land are there to reclaim in that way? It doesn't solve the problem of what most of us are involved in.

PEPPER:
But it is about monumentality. It is about re-creating or creating monumentality. The urban landscape is not the only place for monumentality. Actually, it is important that nature also has the interference of the artist whenever possible so that monumentality continues. But it is not a monument anymore! That is why I asked for definitions. I do not disagree with anything Hilton said in terms of monumentality when it has to do with monuments. But we do have a problem about size.

NOGUCHI:
I wonder if it is possible to make a monument in nature out of a hill, for instance. What are we going to compare it to? Take the biggest mountain, and if there is no other mountain around to compare it to, it might just as well be as big as a peanut. There is no comparison!

PEPPER:
You use rocks.

NOGUCHI:
All right, but it is only relative to what is around it. It is small or big. Everything is relative.

PEPPER:
Scale. You use scale.

NOGUCHI:
That is what I am saying. Everything is relative. Therefore, it is only in relation to your surroundings. The monuments that we have today, in cities, are the buildings. Faced with that, you can only make another bigger building like the Astrodome here for which I am full of admiration, but then beyond that, what do you do?

BOLOMEY:
This leads me to a question I wanted to ask Mathias. In 1957, 1958, with Barragan and Pani, you made an enormous piece. Why? I mean really big! How big is it!

GOERITZ:
It is 170 feet. They wanted a fountain. There is very little water in that district. The fountain would show water, and everybody would believe there was a lot of water; and people would buy the ground. But I had a tower complex. In fact, I still have it Some analyst told me it is a fear complex. Maybe it is. However, I love towers. That is why I love the city of New York. I love towers, so I made towers. (Applause.)

When I designed this group of sculptures, it was like always. The square was designed by the Mexican City Planner, Mario Pani. I wanted it bigger and the towers much taller, but they did not allow it. I had to stick to what I considered a modest size. The architect Barragan accepted and defended the project beautifully, and then of course the men with the money came in, and they were the most important ones. They liked the

project idea. When they said, "Why not?", that was it! Also, credit should be given to the clever engineer who started construction instead of waiting until the bank would give the money. Thus, it is always a combination of several factors. I do not know whether or not I answered your question. It is just that I like very much these huge things. I like the city of New York, I do not see why we should not be allowed to build monumental sculpture. Why not? If this is a democracy, then I can do what I want, no? If my wife dies, and I want to make her a tombstone, shouldn't I be allowed to do that because it is now the fashion to be a conceptual artist?

BOLOMEY:
I am satisfied with your answer. I am sure every body is.

MALLARY:
No, I for one am not satisfied, not unless Mathias, in his reference to a "conceptual" tombstone, is being deliberately facetious. Democracy does not imply the right to inflict harm on others, or even to inconvenience or annoy other people to any serious degree. Nor does it imply the right, in the name of public sculpture as a supposedly worthy and uplifting influence, to impose bad art on a hapless public. Like the unrequested distraction of a transistor radio, the sheer obtrusiveness of a large, strategically placed public sculpture can sear itself into the consciousness of those forced to live or work in its vicinity, or who have to pass by it in order to get to where they are going. A work of this kind, rather than generating a more wide spread sensitivity to art, can instead encourage numbness and hostility. Indeed, it is an open question as to whether even good sculpture should be imposed on those who would rather forego the experience. There should be places where large, outdoor sculpture can be visited by those inclined to do so, but I seriously question whether there is any right or obligation to simply thrust an unrequested cultural experience on the public at large. And there is also the question of the right of the original designer of a large public space *not* to have his (or her) creation mucked up by a discordant visual note sounded by some well-meaning but insensitive or incompetent sculptor who likes to work large and is looking for a captive audience.

BOLOMEY:
Before we get into an argument, I should like to ask Isamu a question: Why did you design the Chase Manhattan Bank Plaza the way you did?

NOGUCHI:
I really wanted to ask Mathias whether or not he still considers what he did a monument.

GOERITZ:
I did not want to make a monument, but somehow I am still sufficiently romantic, probably because of my personal background. For some time I saw these towers as the "fingers of God," as a cathedral of the 20th century.

NOGUCHI:
I think of it as a monument, but on the other hand, if you put those in New York City, would they still be a monument?

GOERITZ:
Surely not. But you see in New York City, they would not pollute very much, but...(laughter)...if you touch the landscape, it pollutes.

MALLARY:
Is that because everything touched by contemporary civilization—including beautiful landscape—pollutes and is polluted in turn?

NOGUCHI:
This brings us to your question, you see as to why I did the Chase Manhattan Bank Garden the way that I did it. I did it because I was asked to do it, first of all. But the reason I did it the way I did it, and the main problem I faced at that time, was the size of the building, and it is in a hole. The question was how to cope with the size of the building with the material and economics at hand. I had to borrow some kind of power from someplace to cope with the building. To me, the placement of the rocks, although they were seven stories down, had to relate to the surface in such a way that they were both emerging out of it and going beyond. That is to say, the effect of the rocks was not merely something static lying there, but that they were, in the suggestive way, filling the space above and beyond to the stars. That is the only way that I can explain why I did what I did, within limits. It is very difficult to work with natural mediums in the artificial situation of cities, because a tree looks like nothing. It is just out of scale. So are rocks, and so is everything else, because of the relative scale of buildings.

BOLOMEY:
Robert, is that pollution in your mind?

MALLARY:
No, I would not agree to that. A work of public art that is well integrated with its surroundings reinforces and enhances the total effect by a process of visual synergism that is the very opposite of uglification or pollution. My point is that a misapplied individualism on the part of the sculptor, or an obsessive drive to self-expression at any cost, should not be taken as an entitlement to disregard the constraints imposed by the setting, whether its location is the city or the countryside. One of the reasons Isamu Noguchi performs so outstandingly in the sphere of public art is that he is so incredibly sensitive to the specific features of the site as these determine both its constraints and for accomplishing something interesting. Because of my current involvement with surface mine reclamation, I am particularly interested in Isamu's pioneering contribution to what is now called earth art and "site"; in particular, I am interested in those seminal earth works and constructed environments in which he used earth, rocks, grass, and other natural materials in a natural setting. Hence, I welcome this opportunity to invite him to comment on these works and to discuss his conception of nature as a medium for art.

NOGUCHI:
Well, I think it is the ultimate medium. I love working with natural mediums, rather than artificial ones, although I do work occasionally with the others, also, especially when it comes into so-called large-scale or monumental size. We are then obliged to work with an artificial medium, because natural mediums cannot cope with the size. I have tried to work with stone in a larger scale, but it is very difficult, especially if one wants to respect the nature and the quality of rocks. You know, I have worked in what I call gardens. You can call it mountains, you can call it other things, but that is nature, and nature's scale is related to man; man belongs in nature. I mean, man can walk on the highest mountains, and he is still at home. Therefore, I do not call it monumental. I think monumental implies a certain aspiration beyond man's own scale.

KRAMER:
I want to make two comments, really. One about what Mr. Noguchi is saying, because I think this is the first experience I have had of serving on a panel and learning something from it! I have just learned something, and that is how Mr. Noguchi's work fits into this discussion, if I may presume to say so. I think particularly of the garden at Yale, for the Beinecke Library, which I confess I did not entirely appreciate all the times I had seen it, until about two years ago when I was doing some work in the basement of the Beinecke Library, sitting in that reading room and looking directly into the garden for hours at a time. Suddenly that day, I felt that I understood what this garden was, and I think probably the Chase Manhattan Plaza is the same, and that is that they are really "anti-monuments." They give you a kind of release or spiritual retreat from this over-bearing, insistent pressure of the monumental. That is why they succeed as marvelously as they do, perhaps, but they require the other term in the dialect, so to speak. They require this kind of pressure you want

to be released from to work as well as they do, and they are extremely beautiful. Apropo to Mr. Mallary's comment about visual pollution, it had not occurred to me that this would loom as big a problem as it might, until I came to this Conference and realized that there were as many sculptors on this earth as there are. Milling around at the museum last night, I thought, "All these people or at least most of them are sculptors!" All I could think of was a wonderful line in one of Paul Vallerie's essays, where he talks about the feeling that he has in a museum. He is walking through this museum and suddenly he wonders, "Who is to defend us against all this art?" I suddenly begin to feel this way. Maybe we need some kind of environmental protection agency to protect us from this deluge of sculptors that is about to descend upon us. It is rather terrifying! We know that most of it is going to be very bad because most of it always is. (Hesitant laughter, then applause.)

KRAMER:
No, there are no more ephemeral materials anymore. We make materials that last and last!

GOERITZ:
But they take them off. After a while, they cut them down.

KRAMER:
Well, I am only being partly facetious. I think it might be a problem.

PEPPER:
I think it always has been a problem. The most interesting thing about art history is to discover that there has been bad painting and bad sculpture all through the history of art. But the fact is that after a long period, it sorts itself out: the good remains and the bad disappears—frequently not, but more often, yes. The most interesting thing I have heard on this panel is that we have been talking, up to now, about how we get the public to understand public art. We have been saying—were you here earlier, Hilton?—that there has to be certain amounts of exposure, and there is obviously an understanding of risk in public art, but what happens is I have suddenly discovered that a renowned, intelligent art critic also had to be exposed like the rest of us, to experience over a long period of time something he may have rejected at the beginning and eventually learn he should accept—like the rest of us—your experience with the garden at Yale. It is reassuring that we all have this possibility to learn and grow.

KRAMER:
Well, that is what it is all about.
(Applause.)

BOLOMEY:
Would anyone like to answer this question? Is there a different aesthetics in large or monumental sculpture than there is in a three or four foot tall sculpture?

MALLARY:
There should be a more responsible aesthetics, that is all. How can it be denied that a large sculpture installed on a public site imposes a special aesthetic responsibility on the sculptor? A poor or mediocre sculpture can be a searing personal failure for the author, but it is hardly a public transgression. Little harm is done in that respect. But the same thing executed on a large scale and installed in a public respect. But the same thing executed on a large scale and installed in a public place can—as I have already said—amount to a form of extreme public annoyance and distraction.

SUGARMAN:
That is a strange statement, as if the artist can play around without regard to what he does in the studio as long as he can hide it in the closet. But suddenly, when he is doing a big thing, he has to bring all his genius together. He did not need it for the small thing, but does need it for the big thing. How do you know that you are not going to make a mistake? Beverly talked about risk. Everything is a risk! Responsible—we are always responsible. You are asking for guarantees of a kind that do not exist!

MALLARY:
I am simply trying to bring out that the sculptor, in becoming involved with a project of public sculpture, is taking on a special kind of risk, a responsibility to the general public that does not apply to the privacy of the studio, home, or even to the private gallery or public museum, both of which are visited by a segment of the public that is willing to confront a great deal of bad art in order to seek out the good. But this same confrontation should not be imposed on multitudes of people in public places who have in no way asked to be subjected to this kind of experience. This is what I mean by a more responsible attitude on the part of the sculptor—the responsibility to create something that is simultaneously first-rate in quality and appropriate to the public character of the site. If these criteria cannot be met, then the sculptor should avoid this particular *genre* and settle for a different sculptural medium and a more restricted public.

PEPPER:
I should think that is understood, that every one of us is responsible. I am talking about people in general. I think you have to start with the positive aspect that we are not all killers or aggressors and that we have a very serious responsibility. You are a man working with a sense of responsibility. Someone else asked, and it has been inferred here, what sense of responsibility do you have if you are doing what you call monumental art or something else? I assume that your responsibility is such that you will take every possible care, and your attitude will be very responsible. You are not going to be casual about what you are doing.

MALLARY:
We are concerned here with public art that is sometimes genuinely monumental in scale. Traditionally, public art has been created for a particular public space with the understanding that it is to remain there for an extended period of time, even centuries. But contemporary art is so extremely varied and fast-changing in character—and much of it is so personal and subjective in its expression—that this degree of long-term exposure is no longer a reasonable expectation. Public sculpture will be more widely accepted—can even have an authentic renaissance—in this country, when it is generally accepted by all concerned that once a work has been accepted for display in a public place, it does not necessarily have to remain there indefinitely; that by common consent it can be removed and stored away after a reasonable interval; and that this in no way should be taken as denigration of the sculptor who made the work or as a form of anti-culture bookburning. After all, works are displayed, then taken away and replaced as routine procedure in most museums where contemporary art is shown. There should be a drastic re-evaluation of our attitude regarding the permanent display of large-scale public sculpture, most of which should be expected to be cycled and recycled just as art on a more intimate scale is changed from time to time in the homes, offices, and museums where it is seen.

SUGARMAN:
Now isn't this really a false issue? This is a big country. There are a tremendous number of towns. Granted that perhaps the majority of the sculptures, if we have hundreds of thousands of them, will be bad. We do not know. We do not know the level as more and more sculpture gets done, although we are not at the point yet where we really have to worry about that. I think we have to worry about what we are trying to say now, what we are going to do in the public, not worry about the increase. Actually, I would like to see most people getting a chance to solve that problem.

KRAMER:
I was being facetious, of course, but not entirely. And I think in the kernel of that facetiousness there is an issue, it's the issue of quality.

SUGARMAN:
Yes, of course.

KRAMER:
I believe the question that was asked at the beginning of this last round was really a question addressed to that. I find it significant that no one among the sculptors on the panel is eager to address himself to it, that is, does the question of quality become more problematical and more imperative in a monumental work than it does in a nonmonumental work?
MALLARY:
That is precisely what "responsibility" should mean in this context.
PEPPER:
I think we all answered that we have this sense of extreme responsibility.
SUGARMAN:
When trying to make these definitions, we have been talking, essentially, about quality. When you talk about what should it be—what is it—that is very much part of the quality of a work of art.
NOGUCHI:
There is an aspect which I wish to interject, and this is that a lot of the works of monumental art one sees around are not intended to be there forever. They are just there for a show. They are placed here and there like the pieces in this city, which are intended to go away in a few months. Now why is that happening? I think that is happening partly because the people are not too sure they want them there all the time. They want to make sure they go away like something from the World's Fair you know. There is not a sense of responsibility or permanence to the place. In fact, I have had such an experience in making a large sculpture. I wanted to make something that was to be permanent in the ground, and the person who was purchasing it said, "No. We don't want anything that cannot be moved, for we cannot justify it to our stockholders." This was a company, and unless they could move it, they could not justify it. You see? If it were there permanently and could not be moved, it would have no resale value. This is a fact which probably comes out of the gallery or museum complex within which we have been living. We do not trust ourselves to make something that is really of the earth. I am talking of the place, and the earth, and not just of space in the abstract sense. Your towers nobody could move. You couldn't sell them for five cents. (Laughter.)
BOLOMEY:
I am sure we could go on quite a long time with this trend of thought. However, I feel obliged to ask one question, because of the times we live in. I am going to address it to Beverly Pepper. I hesitate to do this for reasons I think we both understand. We are six sculptors and one art critic here. Only one woman. Why?
PEPPER:
I was invited. Why didn't you ask more women? That was your responsibility.
KRAMER:
There is certainly no shortage of women sculptors.
UNIDENTIFIED:
I would be glad to step down.
BOLOMEY:
But Hilton, you had something else to say. Do you feel that there are perhaps not that many?
KRAMER:
Oh no! On the contrary. I think there are a great many. Women sculptors have attained probably the greatest visibility in the history of art, in our time, and I found it a curiosity that there were not more represented on the panel, but I assumed that that was your choice.
PEPPER:
That is right.
KRAMER:
No, I think that is an accident of programming, because I do not feel it reflects any kind of disposition to take the work of women sculptors less seriously than male sculptors. I do not know of any critic who does, and I do not know of any serious person who does, so I think that is an obsolete issue.
BOLOMEY:

I should like to go on with this, but maybe we should turn to the public, for they have some questions in relation to what we are talking about. If you have questions, would you please address them?
ALBERT STEWART, TEXAS:
While I was sitting here listening to you talk about monumentality, monumental art and art for public places and all this sort of mid and late sixties kind of stuff, I couldn't help wondering in a time when commodity art is being questioned or attacked, how you define your relevance?
BOLOMEY:
Could you repeat the question?
STEWART:
How do you define the relevance of your discussion in a time when our public art is being attacked on sort of a commodity basis or an anticommodity basis?
PEPPER:
The accident that art is called "commissioned" today, is not new. Art of any size, scale or cost has always had patronage, except for small periods in history. The relevance is not because it is monumental and new and a commodity. It has always been a commodity to someone. It was a commodity for the Medicis. It was a commodity for the Popes. They bought it for whatever spiritual reason they had. It was part of history and is still part of history; this is just extending history.
BOLOMEY:
Is there another question?
CECILE HERRING, FLORIDA:
Monumental sculpture, as you all are creating it, seems to be a new style, rather than Ulysses S. Grant in the town square. I wonder if this style of art, and I call it "art," rather than "monument," is on the upswing in the United States? I'll address that to anyone who would like to answer it.
BOLOMEY:
If I may answer that, I would say that it is everywhere—in Europe perhaps more than in the United States.
KRAMER:
It certainly has been vastly increased in both production and acceptance in this country now, more than 20 years ago or even 10, but particularly 20.
ANITA AARON, CANADA:
Artist and art critic. I am concerned in the fact that we are talking about one of the most persistent, willful and irresponsible acts of man—the making of art. It is towards this I address to our art critic. We keep discussing monumentality, when there are plenty of monuments around in the form of architecture, which are monuments to the architect's ego and to the names of the donors, Seagram Building or the Science Center of Morealis in Canada. We don't lack monuments of the kind of aggressiveness in architecture. But what we have in public art is a yearning to be more responsible I think, as artists to the environment calling it environmental art. I myself wrote an article some few years ago, "Monuments versus Totumus," and it is that that I am addressing my question. The lack of totemic quality in the big and public sculpture should be a persistent worry.
BOLOMEY:
(Due to technical difficulties the question can not be heard by the panel.) I would ask that it be asked us separately later, and I am sure we will be delighted to answer.
MARTIN BLASZKO, ARGENTINA:
I heard the moderator and one of the sculptors saying and defining large sculpture and monumental sculpture as just the same thing. I know that all of you are sure that a large piece in the public surroundings may not be monumental and that a small piece may really have a monumental significance. So the question I want to ask is, "Why may a large sculpture not have the characteristics of a monument while a small sculpture will? Please, if you can extend the two words more?
KRAMER:
I should like to answer that question or at least address some remarks in its general vicinity. I want to tell a story about an experience I had when I was in Moscow in the late sixties.

I went to all the great museums in the Soviet Union and met with some of the so-called "underground artists." I was very curious about one thing: I wanted to meet a sculptor who specialized in making statues of Lenin. You who have been to the Soviet Union, will remember that wherever you go in the Soviet Union, there are those ubiquitious statues of Lenin. Some of them are enormous monuments in city squares and on top of buildings. Some of them are tiny statuettes that sit on the desks of commissars. Or there are heads and busts, reliefs of Lenin teaching children how to read, and Lenin on the battlements, and so on. There are Lenins upon Lenins upon Lenins. At last, one day, I was taken to see a sculptor. He was a man well into his seventies, and being in his studio was one of the most phenomenal experiences I have ever had. It was about the size of a gymnasium, and it was filled with Lenins. White plaster Lenins. Some 12 feet high, some 6 feet high, some 6 inches high. The sides of this enormous studio were lined with shelves, and on all the shelves there were Lenins. Lenins as far as the eye could see. Some of these Lenins were monumental. That is to say, they were larger than life. I think that here, while not a complete definition by any means, is where any complete definition is going to start. That is to say, the monumental, whether in actual size or in quality or effect, is something that suggests something larger than life, larger than the individual existence, and as I said, I do not feel that is the complete answer to the question, but I think it is where any complete answer is going to begin.

BENSON WARREN, OKLAHOMA:
The question I would like to ask the panel in general is that, since most of you do have international fame, how would a person such as most of us here actually get to the top?

BOLOMEY:
Work, perseverance, and sometimes, luck.

DAVID ROGERS, INDIANA:
I would like to know what the panel feels about the idea of having government money, which is really our money, taxpayers money, even artists' money, going into public monumental art. Should we make an investment in art? As a corollary of that, is monumental art, or any kind of art, really necessary?

BOLOMEY:
A practical question. Anybody wish to answer that one?

ROGERS:
We just had Mr. Kramer's comment on the Lenin problem. I am in favor, myself, of the government finding a vehicle for investing in its artists. I think we are a natural resource, but how do we avoid the kind of problem that you noticed in Moscow, Mr. Kramer?

KRAMER:
In the production of Lenins? That is easy to avoid because we have no Lenins, and if anyone tried to create the semblance of a Lenin for the purpose of memorializing him in sculpture, he would be laughed right out of town. Our culture has too great a sense of humor to endure it.

ROGERS:
But that is not really what I mean. Should we invest in monumental sculpture and make it available for many artists to participate in?

KRAMER:
Well I do not understand your question, but I think one thing to understand in the question of government money for monumental sculpture, is the relation of the amount of money the government spends on the whole. It is a tiny bit of money, and a good deal of government money is spent on things that are much worse.

JEROLD JARRARD, INDIANA:
I would like to know if the artist has not perhaps lost his intent in creating something for the lure of monetary gain in regards to physical measurement? Might we reconsider the monetary reward on value, rather than on size? My question is directed to Mr. Sugarman and Ms. Pepper. Would you be making large sculpture now if you were not being paid more per foot?

PEPPER:
My answer is to say, simply and quickly that for the large sculptures I have been making, I, myself, have been paying a good portion of the cost. So yes, I make big size monumental sculpture also for myself.

JARRARD:
I believe the phenomenon is relatively young in this country for people to make large things unless they are subsidized by the government.

SUGARMAN:
I think that is a nasty question. We don't get paid by the foot. In the Baltimore piece I am doing, I was given the opportunity to use an area that was roughly eighty feet. I could have given them a tall, thin sculpture if I had insisted that this was what I wanted to do. I made a big one, because that was my aesthetics for that particular space. Most of us do not measure the size of the sculpture by how much will be left over for us.

PEPPER:
A very important point that I keep forgetting—most sculptors do not make money from monumental sculpture; they usually make more art for the money! This is a big and very important thing that has to be said. The larger the sculpture the less money an artist makes. He has spent so much of his time and money for the production that very little is left over for profit. Profit comes from small sculpture.

BOLOMEY:
Now comes the time for a last question.

JOHN TORRES, ITALY:
I just finished a survey for the Ford Foundation on art in public places, and one of the things that kept coming up was the problem of audience reception to modern art. Does the panel have any ideas on how to increase the receptivity of what is sometimes referred to as an unsophisticated audience, when what you are making comes from a sophisticated point of view, and the people who choose you have a sophisticated point of view? The point that I have is, where do my parents come in? They were working people, and I want to make something that speaks to them.

NOGUCHI:
I am not all that knowledgeable, but there is an exhibition here at the museum in which a section is devoted to General Services Administration commissions of sculpture, and I think that it is rather astonishing—the level of art, and so forth—that they have been able to get away with. Since they are a responsible government agency, they would be out of a job if they were really criticized. I think there is a general acceptance of that sort.

BOLOMEY:
May I add that exposure does teach everyone. Vincent Van Gogh's work was not recognized by anyone except his brother and two or three friends. Now everyone who sees a reproduction of Vincent Van Gogh, likes it.

PUBLIC SCULPTURE IN AN ANTI-SOCIAL AGE

Hilton Kramer
New York

. . . either sexist or otherwise prejudicial to that disembodied sense of the self, the self stripped of its worldly attributes that seems to have emerged as an ideal public identity. And yet these same pieties offer, in place of the old forms of polite address, only a species of social jargon that even if it were not offensive to one's sense of work-a-day reality, it would be inappropriate to employ on an aesthetic occasion, because it is so egreciously offensive to the aesthetics of language.

No, there is no acceptable way to greet this gathering without collaborating in the fiction that we are all somehow uniform spirits. So, reluctantly, I abandon the attempt and will say simply, "Good evening," hoping that the sun worshippers among you will not regard that, too, as an unnecessary and impermissable form of moral discrimination.

If I linger for a moment over this problem of an acceptable mode of public address, an acceptable way for me, as a speaker, to address you as an audience, an audience I cannot bring myself to regard as either unisexual or uniform in its other essential qualities, it is not to postpone a consideration of our subject this evening. But on the contrary, because it seems to me a significant corollary of our subject, for public sculpture today is, I believe, in a situation very similar to that of the public speaker searching for a permissible mode of public usage. The sculptor, who ventures into the arena of public space, seeks to offer the public a symbol of unity and an experience of coherence. Yet, both the sculptor and the public know in their hearts that this unity and this coherence is something of a fiction, a form of polite address, if you will, that averts its glance from the divisions and subjectivities and outright conflicts that separate us in the normal course of our social existence.

The sculptor, who thus ventures into the arena of public space, invites us, too, to avert our glance from everything in the social environment that is divisive and fragmenting, everything that isolates us and entrenches us evermore deeply in that sense of isolation. The social environment of public sculpture is, more often than not, an urban environment. The urban environment today is, alas, an anti-social environment, an environment in which we no longer feel at home, in which it is difficult to feel either comfort or safety or fellowship. That delightful and beckoning sense of mystery and romance, the sense of promise and energy and fulfillment that was once the distinguishing feature of urban life making the metropolis the natural goal of all talent and ambition, not only in art, but in virtually every field of advanced human endeavor, has, within the course of the lifetime of all of us, here this evening, acquired a promise of another sort. The promise of something sinister, threatening and malevolent; something we now feel an instinctive need to guard ourselves against.

This radical alteration in the urban environment, in the social space that is the natural environment for public sculpture, has, I think, significantly altered the moral atmosphere in which we think about public sculpture. So, too, have other important changes in the social fabric. Foremost among these is our changed relation to the public ethos, and specifically to the imagery of public heroism. Indeed, even to invoke the phrase, "public heroism," is to place it at a considerable historical distance in the present condition of our visual culture and, indeed, of every branch of our cultural life, which to the extent to which it concerns itself with notions of hero-

ism, public or otherwise, does so only ironically, even sardonically, with the intention of reminding us of its falsities and pretentions and certainly not to exalt it.

Yet, we need to remind ourselves, in speaking about public sculpture, that the concept of public heroism was once inseparable from the concept of public sculpture. We used to raise *statues,* as they were then quaintly called, in public places in order to commemorate and exalt public heroes and their heroic deeds. But even to speak of it today brings a knowing smile. How long has it been, I wonder, since sculptors spoke of making "statues"? I have, myself, never heard a sculptor use the word in my lifetime, unless as a term of contempt. Instead of statues, our sculptors now offer us "structures," and it is in the nature of these structures to not encompass anything of the symbolism or piety once associated with the statue. Where, even if our artists were aesthetically disposed to represent them in their sculpture, would we find the public heroes to commemorate?

In our culture, we are more at home with anti-heroes than with heroes, and the notion of erecting a monument, a public monument to an anti-hero is, correctly I think, recognized as a contradiction in terms. The anti-hero inspires irony – not the kind of piety or respect or admiration that can be translated into the materials of a monument. The anti-hero is, in essence, the hero or substitute, surrogate hero of an antisocial age. The image of the anti-hero is something to savor in isolation, in the privacy of our discontent, not to exalt on public occasions. The anti-hero divides; it does not unify. It speaks to the "underground man," as Dostoyevsky called him, in all of us. A monument to this underground man would be an absurdity, too absurd even for our absurd age, with its Gargantuan capacity to absorb the absurb. No, the statue is definitely lost to us, for the moment at least. I doubt if its loss will be widely mourned, except, perhaps among the population of pigeons, who enjoyed, as you might say, a special relationship to the public statue. Perhaps not even among the pigeons, for the structures that have so speedily replaced these statues have not, on the whole, showed themselves to be inhospitable to the pigeon's peculiar needs.

The passing of the statue will not be mourned among the rest of us, because it was always, perhaps, an impure genre, an impure form that mixed, and often woefully mixed up aesthetics and civics, art and social piety, culture and patriotism in ways that we no longer find sweet to our taste. There is almost nothing that modern taste despises more, nothing that it regards with greater condescention or contempt than an impure form of art.

Nowadays, we want our aesthetics neat and straight and uncontaminated by any admixture of extra aesthetic sentiment. We not only prefer structures to statues, but we want our structures to be pure, purely what they are, and not something else. We do not want them to remind us of anything but the artist's immaculate conception. We want these structures to be like the new concept of the self – stripped of worldly attributes and workaday associations; to be something essentialized and universal; to speak with the force and clarity of an axiom untethered to specific social circumstance or biographical contingencies or other exigencies of particular experience. We are all, in this respect, children of the modern movement, for it is modernism which transformed the art of sculpture more radically, perhaps, than any of the other arts that it affected. It is modernism that has shaped our taste, our values, our whole notion of what an aesthetic object, a sculptural structure, a public monument should be and should not be. We are all, like it or not, modernists together now, if only because there is nothing else to be.

Yet I see no reason why, being modernists, we should be uncritical modernists, and there is, indeed, plenty of reason to be critical. Among other reasons, it is in the nature of modernism to be critical about itself. One could even say, without risk of exaggeration or distortion, that that is what, in its essentials, *modernism* is: a succession of criticisms, analyses, autopsies that modern artists have performed on their own works and on the works of others, on the conceptions, ambitions, and fantasies of future work.

Modernism is nothing if not self-critical, and that in itself gives us the warrant, even if nothing else did, to re-examine this orthodoxy that now holds us in such thrall. This orthodoxy insists on essential, on axiomatic, on universal forms, on the kind of denatured generality, even where circumstance and the common places of ordinary feeling might call for something different, something a little closer to the alignment of common life. It is well to remember in this respect, that being modernists, we are all heirs to a tradition that has enjoyed a miraculous success. The success is easy to see, and we see it wherever we turn in the world of art. But mainly, we see it in the museums, in the world of museums, and in those privately held collections of art that seek to emulate both the atmosphere and the quality of museums.

Modern art is, for the most part, museum art. The representative masterworks of the modern movement have passed from the studio of the artist to the exhibition galleries of the museum, with only a kind of furlough, you might say, in between. I think it accurate to say that important works of art and, alas, even a great many unimportant works of art are only on furlough when they are in dealers' hands or in the hands of important private collectors.

Important works of art (let us for the moment not consider the others) are going somewhere, and the museums are where they are going. I have no quarrel with this practice myself, far from it, for I owe to it some of the most sublime aesthetic experiences of my life. But in relation to our subject this evening, and in relation to the general theme of this Conference, we need, I think, to acknowledge that this long-established habit of segregating our masterworks in museums and, in effect, the corollary habit of creating these works for the museum, has not prepared us very well for thinking seriously about public art, about the kind of art that is expected to do something more, as Claes Oldenburg once said, "than sit on its ass in a museum." Museums are wonderful! I live in them, and I do not think we could do without them or the kind of art that is created to pass into the kind of eternity that they represent. Museums have the great virtue of concentrating the mind.

Modern art, particularly, is the kind of art that requires and rewards this concentrated attention. Its meanings are often hermetic and its emotions often mysterious.

The museum allows and encourages us to enter into communion with those elements of the hermetic and mysterious. When a work of art enters the museum, it is, to be sure, pitted against other works of art, but it is no longer pitted against the world out there. It is, you might say, segregated in its particular zone of competence and can only fully reveal itself in this protected atmosphere.

Public art and public sculpture do not enjoy this special protection, and there, I think, the artists who aspire to enter this arena of public space have not really, for the most part, prepared themselves to enter a realm that no longer enjoys this kind of aesthetic segregation. Public space does not wonderfully concentrate the mind on a segregated zone of aesthetic competence. It does not pit works of art against each other; it pits them against the world out there. The assumptions governing how sculptures should func-

tion in the world out there, I think, derive, to some degree unconsciously — in fact, probably primarily unconsciously from one of the modernists' traditions — the tradition of Utopian art (primarily the great era of Constructivism in Russia around the time of the Revolution and in Germany at the time of the Bauhaus).

The Utopian assumptions of that art was that the world would be remade in such an orderly way that harmony would so characterize the entire physical and social environment that the sort of denatured generality of the Constructivist image would come to embody, symbolize, and to act as a kind of monumental articulation of this larger social harmony that would come into existence.

As you may have observed, our world did not turn out quite that way. We have somehow failed to arrive at this Utopian harmony, and yet, a good deal of the monumental sculpture that has been created out of the assumptions of these Constructivists' conventions seem not to have noticed that they are expected to pass into a less than harmonious environment.

The assumption of most public sculpture still is either the assumption that it exists in a kind of simulated museum environment or in a kind of simulated Utopian social environment. Somehow the actualities of the world into which it is being deposited never seem very clearly acknowledged.

How sculpture can bring itself to function in what I have called this "Anti-Social Age" is, I am glad to say, a problem that the artists, and not I, will have to solve. But one thing that is the function of criticism to do is to point out the inconsistencies, the contradictions, the unfounded assumptions that seem to govern large-scale works of art in particular.

I think one of the functions of criticism at the present time is to call attention to this sort of imaginary universe for which so much public sculpture seems to be intended. One wonders what experience of our urban culture some of these artists have had, if they can conceive of their work as being appropriate to these much more difficult times. Without offering any solution to this problem, all I can say is — to the ideal of public sculpture — now, much more problematical than anything, that it was undertaken in the entire modernist tradition. I think it is important that the aspiration to create a significant public sculpture means that one element of the entire modernist tradition is over, that the very aspiration to create public sculpture represents a yearning for an integration of art and life outside the museum, a desire which the main stream of modernism never quite accounted for. But it is not something that can be willed into existence. It requires, first of all perhaps, even more than an understanding of art, an understanding of the world into which art, monumental art, public art, is to function. I urge this group, particularly, since this is likely to be the largest assembly of sculptors interested in public sculpture ever assembled, I urge you all and your colleagues to consider the social question of the assignment that you aspire to undertake, even more perhaps than the aesthetic question, because without an understanding of the social question, you will be obliged to go on creating on Utopian assumptions that no longer are pertinent.

Thank you very much.

ELDEN TEFFT: Mr. Kramer says that he will receive questions if you would like to direct them to him at this time.
KRAMER: If you will come forward and ask your questions, I will try to repeat them to the audience.
AUDIENCE:
KRAMER: Well, I gather that this gentleman is not so much asking as asserting that he believes that my description of the present as an anti-social age is incorrect, so I place that on the record, and I will take another question.
AUDIENCE:

KRAMER: I believe what this gentleman is saying is, that to the extent that sculptors are working in this monumental scale, creating sort of Utopian works, they have been obliged to do this because of the architectural environment in which they are functioning, since the architecture itself is so Utopian.
AUDIENCE:
KRAMER: I did not hear Beverly Pepper's talk today, unfortunately, but I can say, without any hesitation, that I do not want to look at sculpture from a passing automobile. I cannot imagine any task less rewarding for an artist than to create an object that is going to be viewed from a speeding motorcar. It is sort of the inversion of the futurist dream: the speeding motorcar being more beautiful than the *Victory of Samothrace.* This I suppose would represent the final obliteration of the *Victory of Samothrace.* To suffer everything that an artist has to suffer in order to create a great work, and then to have to design it to be grasped by the eye from a speeding car, is hopeless. I mean, it is death to the aesthetic spirit if anything ever was. Why not create them to be seen from jets?
AUDIENCE: Cannot monumental sculpture be a challenge to the anti-social age? Can it not be beautiful and yet not be blind.
KRAMER: Well, I hope so. I do not see a great deal of work that goes beyond being what I think of as a kind of co-efficient of the age. Not being an artist myself, I cannot imagine what that would be. It is for artists to imagine it. But I don't see that most monumental sculpture really challenges the assumptions of the age, and I do not think it is an accident. That is why we are in a period of such tremendous patronage of monumental sculpture. I think that it is recognized that there is very little in this monumental sculpture that challenges established opinion and established conventions.
AUDIENCE: What do you see as the role of Black art or Afro-American art in terms of acceptance by society and in terms of monumental sculpture?
KRAMER: I do not see that the problems of Black artists are any different in this particular issue than they are for any other artists in our society.
AUDIENCE: What do you base that on?
KRAMER: My assumptions of human nature.
AUDIENCE:
KRAMER: The gifted are all the same. They bring a certain experience to bear on certain fundamental aesthetic issues, and I am not a believer in aesthetic segregation.
AUDIENCE:
KRAMER: The question is that a good deal of public sculpture today is more an expression of Nihilism than of Utopianism. Well, the Utopian and the Nihilist views are not all that separate from one another. I mean, one is a kind of inverse of the other. That is to say that the Nihilist is a kind of inverted Utopian. But I don't basically agree with what you are saying or what you are suggesting. It is not Nihilistic. Most of the public sculpture, I think, takes basically a much sunnier view of the universe than I do.
AUDIENCE:
KRAMER: There are laws governing the defacing of public and private property, vandalism, etc. Whether or not they can be enforced is something else. If an artist does not want to run that risk, then he should not allow his work to be placed in public view. But I cannot see that it is any kind of issue. People deface art objects in museums, too. We live in an unsafe world.
AUDIENCE:
KRAMER: Where are the architects? Were they invited? I am appalled at how few art critics are here. I feel like the lamb being taken to the slaughter. Though since I have my innings, I am not complaining. I suppose the architects are not here because they were not invited, and that's a reflection, I suppose, on the way that sculptors feel

about their work. Perhaps they feel that they have to assume, even though it may be a false assumption, that the conception of their work is wholly independent of what architects do and think and impose. I was not involved in organizing the Conference, but I do think it is curious that there are no architects here that I know of.

AUDIENCE:

KRAMER: The question concerns the problem with contemporary architecture and contemporary sculpture, and the questioner was making reference to some issues that were discussed at the panel this afternoon. I cannot answer that question, but I would say this about it: I think the real problem is neither with the sculptors nor with the architects, but in the lack of any kind of integrated thinking between them. That is to say, sculptors, if they had total control, would make their work and oblige architects to work around it, so to speak, in a way that would enhance their conception. Of course, architects feel exactly the opposite way. They want to put up their buildings and provide a discreet and not too obtrusive space in which to have a sculpture as a kind of prestigious crown to the conception.

Neither approach is a satisfactory way of working toward a serious solution, because it is in the relationship of monumental sculpture to architecture that a great many of the problems occur, and I do not think public sculpture is going to ever reach any kind of monumental artistic significance until that integration between architecture and sculpture occurs. Of course, where you are going to find the architects who are going to think about sculpture in those terms is a problem that I cannot solve for you either. Most of them think of sculpture as being even less important than their clients.

AUDIENCE:

KRAMER: The question is, "Is there some numerical ratio that should be obtained between the height of a sculpture and height of a building in order for the sculpture to appear monumental?" I do not know. I would hate to think it was that pat, but I can see that there are probably a great many bad sculptors who think of it in those terms.

NOGUCHI:

KRAMER: That is a rather serious criticism if it is true. Mr. Noguchi was asking the question, Why is it that critics like myself do not review a public sculpture if it is not related to a specific gallery or museum exhibition. He says that he has done a number of these works and they have never been reviewed. So far as the *New York Times* is concerned, I think it is more correct to say that they have not been reviewed by me; I believe that Mrs. Huxtable has written about them, and, in that respect, they fell into her orbit, because they were works that were combined with architectural projects. It is, I suppose, fortunately or unfortunately, an accident of the way that our particular newspaper is organized. However, I hope to remedy that situation next time around.

AUDIENCE:

KRAMER: There is one thing that audiences like this have in common with my editor. There is nothing they love more than a trend, and since I have spent now 11 years trying to discourage my editors on the *New York Times* from asking what this week's trend is, I don't think I am going to defeat those purposes by honoring the question. The whole concept of a trend is largely a fictious one, brought on by the attention of the mass media to high culture, and the sooner the mass media gets rid of it, the better off we all will be, I think. I don't know what this week's trend is, because I haven't been in New York for three days.

I will take one more question.

AUDIENCE: From what we know, conditions in Cairo in the 25th Dynasty were lamentable, and also the conditions in Renaissance Italy during the time of Michaelangelo were extremely divisive and difficult, just as conditions are today. Are you really suggesting that good artists should not make good art just because the world is so bad?

KRAMER: Am I suggesting that artists cannot or should not?

AUDIENCE: Should not.

KRAMER: No, I am not saying they should not. I am saying that it is more difficult for an artist to function in that realm today than it was either in ancient Egypt or in Italy during the Renaissance, because we no longer live in a society in which there is a power at the top that can rule on what kind of art and what kind of response to that art should prevail. In a society as pluralistic as ours, art cannot enjoy the kind of monolithic aesthetic authority that it enjoyed in those ancient cultures, and if you believe otherwise, you can believe anything. Good evening.

(. . . opening words not recorded)

BICENTENNIAL HONOREES

SEYMOUR LIPTON
New York

ISAMU NOGUCHI
New York

BERNARD FRAZIER
Moderator

FRAZIER: In this hour, or slightly more, the National Sculpture Center, the City of New Orleans, and more importantly, you, the conferees, will extend special respect to two American sculptors. Others were invited, but because of bad health or other valid reasons, they could not be with us. We are sorry.

Our ceremony this evening will be in three parts. First, we will show some slides, and each of the honorees will say a few or many words, whichever he pleases. After the slides have been shown, we will have a brief honor ceremony, largely from you. Then we will have a question period as long as you wish and as long as they can endure. I was going to have Mr. Lipton lead off, but since his slides have not arrived, we will have Mr. Noguchi proceed with his slides and remarks.

NOGUCHI: Hello, sculptors. Lin Emery, an old friend of mine, wrote and said, "bring some slides." So I brought those along which have to do with things I have done out-of-doors or, that is to say, large sculptures. I do not think they are exactly monumental but are, in any case, large. I have included in them a kind of rationale to show you how I happened to come to do sculptures in environments. Although I did a few pieces earlier, I started doing stage environments, you might say, in 1935, when I did a piece for Martha Graham called *Frontier*. I used a single rope stretched from the center back of the stage up to the front of the proscenium which created this extraordinary, hallucinatory division of the stage space.

This later one, which again used a rope, was called *Errand Into The Maze*. I tried to depict the maze with a single rope and a piece of whale gut lying on the floor. You create the maze yourself and become all tangled up in it as Martha Graham did on the left.

I am showing you pieces of a model of Orpheus, which I did with Balanchi and Stravinsky, where they are going into Hades. Again, in the *Whiteney Show*, the piece on the floor was called *Embattled Garden*, having to do with the Garden of Eden, and in it there is a kind of a landscape which is like an apple cut in two with the seeds in the middle. From it rises a lot of rattan rods painted green among which they dance. This, in a way, is a rudimentary landscape. I mean, they danced inside an apple.

This is in balsa wood, which I carved for a piece called *Judas*, and actually, these are the bones or structure over which hung a cloth forming a tent. Within the tent was this animal.

In this piece called *Cave of the Heart*, there is a serpent below, and the metal nimbus is a dress, you might say. Martha got into it and danced a remarkable dance within the sculpture. The sculpture then becomes a vestment which finally consumes her as the flames of the sun and she sinks out of sight. I mean, all this has to do with what I call the hypothetical environment. It is not exactly a Utopian situation, but it is the hypothetical Utopia or the hypothetical idea landscape of the stage within which all action takes place, and the drama there is consummated. That this sort of thing could then be translated into actual life or the ordinary environment, would seem to require an equal sort of confinement, such as the stage gives in eliminating extraneous things

to that particular experience which we wish to enhance with our work.

In 1951, when I arrived in Japan, I was asked if I would be interested in doing a couple of bridges in Hiroshima. This is one of them. At that time, as you see, there was no city. Nothing! It was completely destroyed! Now, this is the main thoroughfare, the main fashionable "drag" of Hiroshima, and the bridges are still there. They were made of cement, and though repaired many times, they look quite good. There is talk of perhaps making them in bronze, but with the skyscrapers all around, it is hard to imagine.

I am showing you this as an example, the landscape design for the Leever Brothers' Building, which I did in 1952. It was not built, but it did arouse enough interest on the part of the Leever Brothers' people so that when the building was finished (this was made before the building was finished), they asked me to make further studies.

This is the next one I did, viewed from above and from the side. I show this to you to demonstrate that within the certain given context of a space, I am interested in finding a solution appropriate to that space. The next picture shows you, that along Park Avenue, there is an overhang of the building. Therefore, the objects had to read from below also. The first one you saw did not take into consideration that you would largely be seeing it from below without being able to see the top of it. So a tall piece had to have some interest from below, too. The confines of a certain given area must be respected in doing any kind of sculpture. I have always held as a prerequisite for whatever I do, that I must have some control over the surroundings. If I have no control of the surroundings, then I shy away from it as being not suitable for whatever I might be able to do.

This is a photograph of one of the elements in the UNESCO garden in Paris, which I did between the years 1956 to 1958. These rocks came from Japan. The concrete is a bench. The wall has a hole which is luminous at night. Here, for instance, is another area in which we have stone as a light source. Those holes are also luminous at night. The benches, which are again made of concrete, allow people of varying importance different heights to sit upon. I made one especially for DeGaulle; it was very tall.

This is a waterfall I did at that time. The rock is 12 feet high with a natural cleavage. The water goes up the inside through a big hole I drilled. A decompression tube at the top allows the water to flow as in a waterfall. The ideograph of peace, which is carved upon it, acts as the points where the water becomes agitated. This is another view of that garden, before the planting took over, just about when it was actually finished.

It is now almost eighteen years since, and these trees have all grown. I have had to go back twice with a Japanese gardener to trim the trees because they grew so much. The garden gets better because nature is involved; the building, I am afraid does not.

This is the garden at Yale, which you saw previously. I tried to show in this, again, a hypothetical world. Those lines in the marble, like lines of force, perspective or direction, are arbitrary, but they give a sense of expansion. This round one just below nine feet high I call *The Sun*.

Now for the Chase Manhattan Bank, which we mentioned before. The stones came from Japan, and the granite blocks were devised by me as a kind of sculpture. That is to say, in this case there is a reversal. It is not a man-made thing on a pedestal, but the pedestal itself is the sculpture. The rocks, of course, are natural. There is hardly anything buried of them, but they look as if they are re-emerging or flying off. Of course, you cannot get these remarkable rocks anymore.

This is the sculpture garden that I did at the National Museum in Israel which was being built for Billy Rose. This is just as it was finished before planting. You will see the transformation taking place as time goes on. Time is such an important factor in the creation of any garden. They say it takes about ten years for a garden to get going, and I think that is perfectly true.

These are very large retaining walls, which were made from the rubble of the hill. Some of the stones are quite big, by the way, as much as ten tons. The retaining walls form the terrain which allows you to walk in this area, which otherwise was nothing but a rather steep hilltop. Here you see, that as time went on, it changed the gravel from that ordinary slag to a settled-in bed. The basalt even looks better. Everything looks better! Time has done things to it. The planting there has been restricted to plants which grow normally in the rather desert area around the location.

The walls are gigantic, but people were quite at ease without the billowing surfaces.

My interest in playgrounds goes back to 1933 or 1934, when I did the piece called *Play Mountain*. I felt that playable space could be expanded by allowing it to be mounted by using steps, etc.

This next one I did some years later, about 1938 or 1939. It is called *Contoured Playground*. Because I had been terribly criticized by Mr. Moses and by everyone else for being a menace to children, the idea here was that since they could not fall on anything except their asses, they would be perfectly safe.

Later on in 1952, I did this playground for the United Nations. But again, Mr. Moses, as I have heard, threatened to not put a railing around the United Nations so that the people would all fall into the East River. So he got the playground to do, and I didn't. For the longest while, I just gave up. Then in 1961, I was again asked to do a playground, along Riverside Drive this time. Since I was fearful of what had happened before, I said I could only do it with an architect who would guarantee that it would be done. You see, I thought I was simply unable to convince people by myself. Louis Cohn kindly agreed to go in with me. We made five different models over a period of five years. All the money was raised. Everything was going to be done, and Waggoner signed the bill and so forth. The next day Lindsay came in and cancelled the whole thing. It was a very sad affair.

This is another one, the fifth one actually. Cohn, by this time had become terribly interested in big holes, and so those are Louis Cohn's holes. I found that working with an architect like him was extremely instructive and very interesting, and I do not think he regretted it, although I must say he spent an awful amount of time. Every time an objection was raised, Cohn would say, "It's all right, start over again." That is how we made five entirely different models.

This is a project I entered for a competition for the United States Pavilion at the Fair in Japan, which was not chosen. This is a playground area of that model, which I was still determined to do. I just could never get one made. There is a play object, by the way, in Soleto, Italy, in front of the cathedral. You know, I would plant them anywhere just to have them done.

This is a red cube in downtown New York.

This is something I did in Munich, Germany, near the Hilton Hotel, made of granite and anodized aluminum. It is rather big. As you can see from above, there is an artificial river associated with the sculpture.

These are the fountains that I did for the Fair in Japan. You may have seen photographs of them before, but this shows the construction of the base. There were three lakes, this is

the biggest one. The whole thing was made in concrete in order to allow for the tremendous pressures from these very large elements. There were three large whirlpools, and they really made a tremendous effect. Here, you see the three elements. The tallest one is a little over 100 feet high. They were shown the last time I was at this Conference in Kansas several years ago, and I am doing quite a few fountains now. As the light goes on, you can see that the whirlpools are luminous at night. These spirals are about 50 feet high or 12 meters. They go up and down alternately and disappear into the water. This, of course, is another lake, the middle lake which, unfortunately, I spent the most time with and did not get really what I wanted. I had all kinds of effects that could have been remarkable, but they did not get done.

This is the *Black Sun*, one of the many studies I had made for the Yale Garden, and which was finally executed in granite equal to the size of the one at Yale.

This one is near Seattle at the University of Washington. I call it the *Sky Viewing Sculpture*. It is a conception cube through which you can see the sky.

There are five fountains which I did in granite for the new Supreme Court Building in Japan, each weighing seven tons. The water forms a mirror which overflows, and there is a light source which causes the whole area to shimmer with light. There is an open shaft above each of the five. I was rather fascinated by the area which the public is not allowed to see. It reminded me of the Cave of the Bulls in Egypt, and I rather liked the idea of doing something that nobody could see.

These are rock-carved elements I did for the G.SA. in Seattle, thanks to Mr. Thalacker. I am very grateful to have had this opportunity to make something of nature in a city in America, which is different from the gigantic and minimal things which are so prevalent. To me, to be able to return to nature is one of the most important things that we can do. I mean, even if it takes an effort to be contrary to the prevailing structural means and so forth, especially the means that are used to build buildings. I took this opportunity to do what I could, and I think that the G.S.A. is to be commended for being so brave.

This is one of the first models of the project I am doing in Detroit for the Civic Center Plaza. The big fountain in the middle is the $2 million fountain for which Mrs. Dodge provided the money. It is a very powerful fountain of 800 horsepower with a great many varieties in the flow, and some day I hope to be able to show you a film, or perhaps you will be able to go there and see for yourselves how it will work. In fact, I believe it will be operative by next August. This is the pylon itself, which is already up. It is 120 feet high. It is seven feet on the side and twists as it goes up a quarter turn. It is sheathed in aluminum and welded all the way up and down at the corners. It looks very heavy and massive.

This is a project in which I am very interested, a fountain proposed for Omaha in the Missouri River. You notice the ring at the top, which is about fifteen feet in diameter. That is the Darius Windmill developed by NASA. It will turn to help bring the water up from below. The water will spray in towards the windmill. The whole thing turning at the top will be luminous, and as I said, it will be in the middle of the Missouri River. We are still trying to raise the money to do it. The people there are determined, and I trust that one day we will get it done, though I am afraid not during the Bicentennial. I am very much interested in it because for me, it ties in the whole of nature—the wind, the water, the sky. Beyond this is a marvelous wood which you see on the other side of the river, which is the Council Bluffs side. The whole thing is, to me, a hopeful, if not Utopian, relation between sculpture and the environment of the river. The general terrain around there is very extensive, as you know, and therefore, you will be able to see the sculpture from miles away.

When I do a thing like this, you may say, "Well now, where are the confines upon which he insists?" Well, the confines in a thing as big as this will be within the context of the river basin in which the water will flow, and so forth. There is a rational; I feel that it is really within the confines of, let us say the river system, the city, and the whole riverside development through which they are going.

This is a model, a playground, which I am finally making in Atlanta. This shows only the proportion of it, but I just wanted to give you an indication of what I am doing in hopes you will take a look at it some time towards the latter part of May.

This is the sculpture which I am going to dedicate tomorrow in Palm Beach. It is a fountain in the form of a tetrahedron. This is the competition I did not win, which I, nevertheless, got the chance to do. You see, it is an extraordinarily beautiful situation. I believe that I was correct in my solution, although Mr. Robert Morris got the prize, instead. You can see the water flowing, and I find it very poetic. Thank you very much.

SEYMOUR LIPTON: There was some misunderstanding about the slides. I will try to verbalize. Essentially, the world of involvement that concerns me is centered around the life and soul of the individual—of the person as a center in nature from which everything radiates and reciprocally comes back to man as the center. While I was here yesterday, I thought in preparation for the slides, I would read this as a kind of introductory statement of what my concerns are.

What I look for in sculpture is the presentation of feelings, meanings, of a lived reality, reality with pleasure and pain, ugliness and beauty in the world today. Scale and environment for work has importance, but for me it is not central to aesthetic significance. I look for a fusion of form and substance adequately conceived to fulfill my needs. Formally, I am interested in the architectronics of an autonomous and activated object in space. What is vital is the energizing of form against counterform, contained space against its walls. Interior and exterior, all has a single dynamism, but above all, this formed reality is played against some suggested area of existential reality, the substance of life and the world around us. I hope to harness all of these forces in achieving a unified presence through an economy of forms toward a classical restraint and dignity. In today's world, I find among other things, life at dangerous odds with technology, in confusion, in ironies, and paradoxes. Here sculpture has the opportunity to plumb the grotesqueries of our time. The biomorphics of life and the geometry of the machine in coalescence. The sculptor thus, through his work, can bring into sharper focus the reality of our times, provoking and illuminating whole areas of the mystery of the feelings and meanings that people are often dimly aware of. Having said this, I thought it would lead us into a discussion of slides, but I think at this point, I probably will invite questions or possibly suggest the nature of the only piece that is available in New Orleans right now. Namely, the piece at the museum which is called the *Defender*, which right now belongs to the National Collection of the Smithsonian; they recently acquired it. I do not know if you have seen the piece, but it is a direct metal construction. It is not a casting. It is an organic construction, which means that the shapes being complex in their orientation and relationships required a technique and material which I developed many years ago through the use

of the oxyacetylene torch. A sheet metal, namely a white bronze called monel metal, is used as a base upon which the surfaces are braized. Through the heat of the oxyacetylene torch, these surfaces warp, and they have to be hammered out on the anvil before being brought together for fusion. Thus, the object is gradually built up until the final work is completed. I work essentially from drawings, not in any sense of a graphic art, but rather as tentative experiments in imagery, to fulfill my own needs. These images then are transposed into small maquettes, about ten inches in size, a very rough, structural, spot-braized object. I let them stand around the studio and live with them as they accumulate. As I live with them, I change them. The element of chance and spontaneity is very important to me in spite of a temperamental or temperament-involved directional force that I am partly conscious of, partly not conscious of, but always certain of what I do not want and what I do not need. My pieces are made as high as 12 and 13 feet. It is a difficult technique, and though I work with assistants, most of the finishing work I do myself.

The questions that could be asked without the slides I will endeavor to partly anticipate by several additional comments. It is essentially an anthropocentrific world in which I work, even if I think in terms of animal life, vegetable life and the machine. They are all brought together in some unifying process. I do not even know what provokes the original image. It may start by seeing some upside down picture of a broken automobile. It may start by some clutching feeling in my stomach. I have thousands of drawings which are accumulating and never have actually been completed in sculpture. The time involved, and the forces that are at play in making these things are, of course, exciting only in terms of seeing the finished work. There is a lot of work in the making which is dull, at times almost a drone-like involvement, but there are moments of high excitement. I think, at this point, it would be reasonable to have questions, both to Noguchi and myself, and we will let it go at that.

FRAZIER: Thank you both, Mr. Noguchi and Mr. Lipton. How does one actually honor men who have spent a lifetime with the labor that you know about, with the devotion and constant effort that you know about, and with the achievement that they have come to? We have decided to read a short biography and then honor them simply by your participation—no laurel leaves, no golden crowns—but with your acceptance and your appreciation. The biographies are abridged, partly by the sculptors and partly by myself. I can assure you that there could be pages and hours of interesting things read, as you all know. I shall read first Mr. Seymour Lipton's. He is represented in numerous private and public collections, has completed many public commissions and taught at the New School for Social Research from 1940 to 1965, in New York City. He was visiting critic for the Yale Art School from 1957 until 1959. He exhibited at the Museum of Modern Art with a group of twelve American sculptors in 1956. He has had a one-man show at the *Venice Biennale*, 1958, various one-man museum exhibitions through 1959 to 1973, and of course in many smaller private and participation exhibitions. He is a member of the National Institue of Art and Letters. His awards are many. Among them are the Logan Award, the Chicago Art Institute in 1957; the top acquisition prize at the *San Paulo, Brazil Exhibition,* 1958; the silver and gold medals at the Architectural League in 1959 and 1962; first prize and gold medal, the Widener Award, at the Pennsylvania Art Academy in 1968, and many others.

Now Mr. Noguchi. I feel that it may perhaps be more interesting to us to know something about his life than to read the four pages of his achievements, since you have seen his slides. His first two years were in the United States. He was born in Los Angeles, the son of a Japanese poet and teacher. His mother was of American Scotch-Irish birth, a New Yorker, by the way, who also had American Indian blood. The family moved to Tokyo, I believe, when the boy, Isamu, was two years old. Isamu attended Japanese and Jesuit schools. In 1918, he returned to the United States, into the confusion of the beginning of our World War. Actually, he had come back to start his formal schooling, but ran into a situation in which the school was closed down for wartime. He had a difficult time, but finally graduated from high school in LaPorte, Indiana. There was some indecision about his career. He had considered a medical career on the advice of people who thought he could make it, but chose an apprenticeship to Gutzon Borglum, the man of the great faces in the Black Hills. He attended Columbia University, and it is interesting to me to note that he worked in a restaurant. I actually wonder how many people in this crowd might hold up their hands, as I can, indicating that they had worked as a busboy at a restaurant in undergraduate days. In 1924, his art career began in earnest, in a rented studio in Greenwich Village. He saw a Brancusi show, and wrote that his "vision was transfixed at that time." In 1927, Mr. Noguchi received a Guggenheim Fellowship to tour Europe where he studied with Brancusi and became acquainted with Calder and many of the other American expatriots of that time. From 1928 until 1932, there seemed to be rather constant travel back and forth from the Orient to the U.S.A. and to Mexico, and the beginning of the nine dance sets, which you saw and heard explained this evening, for Martha Graham and others. In 1950, he won a fellowship with the Ballinger Foundation, for international travel. At this time, sculpture success began on all fronts. From then on, the condensed biography simply reads that he became Noguchi, the international.

As I have said, we have no golden crowns, no laurel leaves, nothing except our extreme, and I am sure very heartfult, honor for these men, the honorees of our Conference. I should like you to consider your applause to them as a salute to the years, the hours, the months of meditation and total devotion to the idea of creating significant form. I ask you now to participate in the principal part of our honor to these really very great men. APPLAUSE.

We have more. The question period will now begin.

ROBERT RUSSIN, WYOMING: This is addressed to Mr. Noguchi. I noticed you made a particular reference to the generosity or the courage of the G.S.A. in cooperating with you: in, I think, a west coast sculpture which is very natural in form, and which you were rather glad you had the opportunity to do. On the other hand, you do a lot of minimal sculptures also, quite a few cubes, and a lot of leaning forms that are in the *avant-garde* tradition today. I wonder which direction you really think is you?

NOGUCHI: Well, I would say both. I live, we all live, in at least two worlds: inside—outside, the ideal—the practical, and certainly in my private world, that which I do for myself without reference to any situation, is different from that which I do in reference to an environmental situation which is generally quite large. I tend to do things simpler and bigger for bigger spaces. It is just a matter of practicality on the one hand. In the case of the Seattle pieces, I tried to bring into an actual environmental space more of the things which I am really interested in as a private person, because, as a sculptor, pure and simple, in development of what I want to do, myself, I am very much interested in natural mediums, stone in particular. I have worked with wood and all sorts of materials, paper, anything. I am not very squeamish about what medium I use, except that I find that stone is the most flexible and the most rewarding because it starts out with something of nature beyond you, and it challenges you to become one

with nature. To me, that object which I work on with stone, I work on not alone but with history, with everything that I know and can call sculpture; that is to say, nature, the wind and the stars, where we come from, where we go to, whatever you will. Ecology, anthropology, all of the factors that have to do with our being on earth, are to me, close to stone. I feel very familiar with stone; I feel at home with stone, much more so than with people. So that is my pleasure. I credit G.S.A. with a great deal of perception, of course, and courage. If I say that I am grateful, I mean to say that I hope that they will continue to allow people to do things which are not necessarily so fashionable. I suspect things of "being fashionable," and I am not profashion. I want to go beyond, and I want to open new fields continuously, if not for myself, then for other people. I should like to have other sculptors to work in stone more and I hope you can find nature as a co-worker in your sculpture.

WILLIAM GOODMAN: Both of you sculptors, Mr. Lipton and Mr. Noguchi, are very involved with cutting away and building up materials. What is your attitude towards much of the sculpture produced in, for example, the late 1960s and this present day, sculpture which could be ordered over the telephone, often very monumental in nature, very large, but which could be put down on a blueprint and built by other people? What are your feelings about sculpture which can be ordered?

LIPTON: I will start in, if you want. The answer lies in my sense of history and tradition. Newness in itself, telephone sculpture, ordering something over a telephone, is peripheral and over the brink, over the abyss of man's singleness, or centrality, in involvement of projecting the meaning of his own life and being directly involved in it. As Noguchi just pointed out, his love of stone is intimate, a very alone, meaningful experience. His hands, his soul, his mind, his stomach, everything is involved in the cutting away and making of it. Similarly, I feel the need for direct intervention with the materials and for the creation of a presence which is living for me. I work in metal, directly in metal. I have worked in stone and wood, but I have found metal more adequate to my needs, the makeup in me, which is driving me in some unknown way to create objects which have mystery, creating in terms of something coming out of my being, directly and continuous with me. However, work which is made as a result of a blueprint and produced and manufactured by somebody else, loses the quality of the human centrality, of the human touch. It becomes a part of the manifestation of the weakness of technology, the making of a machine, and there is a loss of what art really means as an expression of the life of a single human being. You can not produce art, for example, by a board of people sitting around a table and discussing how a thing should be made. I do not think you can produce an important invention in art, a creation of significance, that will last, if it is produced by somebody else.

NOGUCHI: If I may add to that, I would say that the architect is the villain. The architect makes things on a board just like that, and he has corrupted the vision, because without experience of his hands, he designs buildings and so forth, which are lacking in the real knowledge. I mean, I find that whatever it is that you do with your hands is an instruction in the nature of truth of nature—of how things are really hanging together. The so-called architectural approach, which is a rather recent thing—I mean the idea of translating from drawings without having a knowledge of what the structure is—is a lack which I think architects, young architects, are feeling very strongly. Without a knowledge of the structure of wood and the use of wood for instance, how can you make a building and have a sense of its structural integrity? That is why I object to going from nowhere to nowhere. I mean, one can order things on the telephone, but first know what is being ordered.

FRAZIER: May I add to that. I see no way that we can synthesize the sensibility necessary for actual artistic expression by going through the medium of the telephone and a few lines on the paper. Is there another question?

DAVID ROGERS, INDIANA: I carve stone, and I want to know if Mr. Noguchi feels that he has to find a particular soul of a particular stone and resolve that, or will you take an idea and find a stone to fit with the idea?

NOGUCHI: I have done it both ways. I find more and more, the deeper satisfaction of not trying to impose something on stone, but to start from stone and find a kind of conversation between the stone and myself.

VIVIAN FORWECTER, NEW YORK: Mr. Noguchi, I am trying to relate you as a person, and your philosophy of life, society, and civilization to the astonishingly beautiful, positive and poetic, transcendant quality of your work. I am wondering whether or not the positive feelings that you convey in your work are consistent with your attitudes toward society and man, generally?

NOGUCHI: I might attempt to answer that; I do not know if I will succeed but I will say, for instance, that Brancusi once said to me that when a person was no longer a child, he was no longer an artist. I think that we, or whoever pursues the quest of art or what he thinks might be art without being overly deflected by popularity of various sorts, will then be building one step after the other. That is, he will be going some place. I think that I change. Every single thing I do is different from the one before, and I will not make two things alike if I can possibly help it. I think that I get ahead, you know, I am able to walk without falling over because I keep walking, like a man on a bicycle, who is in a suspended state. So long as I am able to keep to that and do not fall on my face, I think I will be all right.

FRAZIER: One more question. Don Thalacker.

THALACKER: This is a personal question. I would be interested in not only your reactions but those, ultimately, of the sculptors here. The question is this: We are faced with and are talking about situations of monumental public works of art being funded through tax dollars, and the initial reaction of the tax-paying citizens to Congress which is frequently not only hostile, but vitriolic. As such, it is a real situation that we must deal with. In the hopes that we can always do better than yesterday, I should like to know from you how you think it ought to be dealt with and ultimately, from the other members at the Conference?

NOGUCHI: Are you asking us how to deal with Congress?

THALACKER: Not Congress. What I wish to know is how would you deal—how should we deal with the hostile reactions of the tax-paying citizens?

FRAZIER: I would like to say, Don, that I think you are doing pretty well at present. I think Mr. Noguchi has already said that. Maybe there is room for improvement.

NOGUCHI: From all I have heard or know about, both the National Endowment and the General Services Administration have done a remarkable job in trying to educate the general public into accepting sculptors of to day, the people that are popular. One thing I might suggest—in fact, my only criticism of both the organizations—is that they are almost too closely duplicative of the popular or well-known people. I mean, these are the people who are well known in the gallery, in the magazine world, and so forth. I cannot blame people for sellecting these sculptors, and I suppose I cannot understand why they should be criticized for doing so.

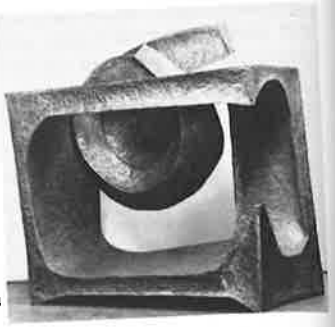
FRAZIER: I wonder if we could agree that perhaps that there has been 100 or perhaps 1,000 percent improvement in recent years.

NOGUCHI: But that is by following. I

am not saying that they are leading. I say they are following very closely the prevalently accepted people, you understand. I am putting myself in the situation of the establishment, which I don't like at all, but there we are. If the General Services Administration is to be criticized, it is only on the basis that they are doing what they should do. I mean, I would prefer that they were a little bit outrageous. I prefer outrageous people, but they are very correct in a sense. In Seattle I was incorrect by doing something in which I thought I was a little off-key. If I was criticized, I thought I was criticized on that basis, and I was rather pleased to be criticized on that basis. I hope you understand.

FRAZIER: Thank you very much, Mr. Lipton and Mr. Noguchi.

APPLAUSE.



COSMOS
Seymour Lipton

THE EMPTY ROOM
Seymour Lipton

DEFENDER
Seymour Lipton

OPEN VAULT
Seymour Lipton

CASTING WORKSHOP

Xavier University

William Ludwig John Scott

The casting of non-ferrous metals in sand, ceramic shell and traditional investment has long been an invaluable tool of the sculptor. Today, with rapidly rising prices, an artist may be limited in what and how much he may work in cast metals. Often a student is exposed to casting, but everything may be "laid on" and the expense of buying a furnace might be beyond his or her financial resources. For these, and possibly other reasons, a small, inexpensive, easily-built foundry facility may be the only way a sculptor on a limited budget is able to cast his work.

A small foundry in the 20-30-40 size crucible range may be built in one day, and for far less than a commercial facility in cost. No special tools or skills are necessary; the foundry may be inside or outside; and since the furnace is made of small components, the equipment is portable and may be easily transported by one person.

In an educational situation, students benefit from actually building their foundry, and a course or workshop in casting may easily include the actual construction of the furnace. The small size and capacity of the facility enables artists to cast more often and thereby gain more experience and skill in working with cast, non-ferrous metals.

The furnace is built of super-duty firebrick (A. P. Green "Clipper" grade) and the number of brick is dependent on the size of the crucible. For a No. 40 crucible, the following brick is necessary:

Straight 9 x 4½ x 2½	37
No. 3 Arch 9 x 4½ x (2½-1)	18
No. 2 Arch 9 x 4½ x (2½-1 3/4)	40
Split brick 9 x 4½ x 1¼	1
Lightweight insulating straight 9 x 4½ x 2½	1

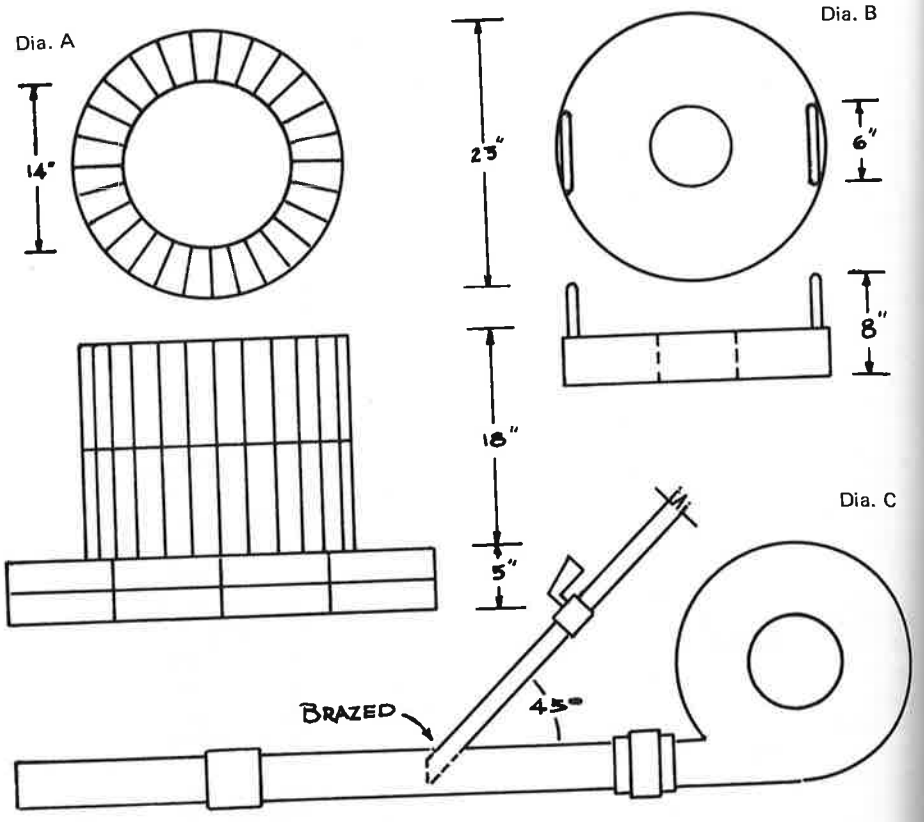
Thirty-six straight bricks are arranged in a square 27 inches by 27 inches double thickness and the arch bricks are stacked on end in a circle (see diagram A). The single insulating brick is cut and fired to make a burner port in the bottom tier. Nine No. 3 arch and 20 No. 2 arch are necessary for each tier and the single split brick is used in arranging the burner port. The bricks are then banded or bound with heavy wire and may be covered with sheet metal. This last is advisable if the furnace will be exposed to the weather.

The cover of the furnace (see diagram B) is made of an iron frame filled with castable refractory (A. P. Green Greencast-97 is recommended). A hole 5 to 6 inches in diameter is left in the center. This hole may be made by placing a cardboard tube or cylinder of styrofoam in the center of the iron frame and pouring the castable around it. The tube or cylinder may be removed after the castable has set and any styrofoam or paper remaining will burn away at the first firing.

The burner is made of pipe and pipe fittings available at any hardware store (see diagram C). A one-inch gas line is recommended, but one of 3/4 inch is acceptable.

The blower is a Johnson blower No. 1207 which delivers 75 CFM at 6.5 inches W. C. and is available from the Johnson Gas Appliance Co., Cedar Rapids, Iowa, 52405. This burner/-blower combination is designed for natural gas at a utilization pressure of 0.25 lb/in.^{2} (7.0 inches W. C.).

The operation of this furnace is simple: A crucible is placed on a crucible block in the center of the furnace and is charged. The cover is put into place and a crumpled ball of paper is lit and placed in the furnace. The gas is turned on and when it has ignited, the blower is switched on. The flame is regulated by the gas cock until



LOW COST MELT FURNACE AND BURNER

a good, steady roar is heard.This furnace, as described, will melt approximately 130 lbs. of silicon bronze "Everdur" (American Smelting and Refining Co., Federated Metals Division, 120 Broadway, New York, New York, 10005) in one hour from a cold start. Care must be taken to insure proper venting if this furnace is used inside.

Crucibles and crucible blocks of bonded silicon carbide may be purchased from American Refractories and Crucible Corp., North Haven, Connecticut, 06473. Crucible tongs, pouring shank and protective apparel may be purchased from McEnglevan Heat Treating and Manufacturing Co., P. O. Box 31, Danville, Illinois, 61832.

This furnace may be used for sand casting, foam vaporization casting, or, in conjunction with a kiln, for lost wax casting. The materials are readily obtainable, and for the most part, quite inexpensive. It is simple to operate, easy to transport, and quickly built. Maintenance is minimal: With normal care, a furnace of this type usually last for two to three years (casting once every three weeks) and then, due to build-up of slag and metal spillage, may be rebuilt. The burner, cover and blower need replacement only after eight to ten years of normal use and care. The size of the furnace may be changed to accommodate a No. 20 or a No. 30 crucible, but the burner, blower and cover are interchangeable.

SOURCES

A. P. Green Refractory Pocket Catalog, A. P. Green Refractories Co., Mexico, Missouri.

Lost Wax Sculpture Foundry Equipment: Sources and Prices, Elden C. Tefft, 3rd Ed., 1968.

An Elementary Foundry Manual, Walter & Cowles, 1967; McEnglevan Heat Treating and Manufacturing Co.

Guide to Copper Casting Alloys, Federated Metals Division; American Smelting and Refining Co.

DREW FRACKOWIAK

MORRIS SINGER AND SUSSE FOUNDRIES

Eric Gibbard
England

The cire perdue (lost wax) process in modern sculpture foundries no longer relies on gelatin as its flexible mould material. Gelatin has been replaced by a two-part silicon rubber, and ceramic shell has superceded grog—plaster or applique as casting medium. (The latter consisted of a mixture of the whites of five eggs, four ounces Gum Arabic, five buckets of French sand and one bucket of clay—it was considered ready to use when the egg whites had fermented.

The slides showed how the mould was made from the artist's model. First, a plaster two-part exterior was made into which silicon rubber was poured between it and the model to form a negative flexible mould.

The illustrations showed the making of the wax copy, attaching the runners (entry points for the metal), investing in ceramic, burning out the wax, firing, casting, chasing and patinating.

Mr. Gibbard explained several methods of forming the wax replica, the method generally accepted being of Italian origin, where the negative mould is filled with wax with a plug at the base which is used to release the wax from the mould at a rate required to allow it to congeal on the surface of the mould.

A method considered to be of French origin is the "cut-core" technique which is no longer possible with the use of ceramic shell. A core of red brick dust and plaster was poured into the negative mould. This core was then reduced by cutting away the metal thickness. The wax was poured between the model and the mould. This method was undoubtedly responsible for the lightweight, finely detailed bronzes emanating from France in the 17th and 18th centuries.

The usual method adopted by sculpture founders today is to "paint" the wax into a negative silicon rubber mould, closing the joints by a final swill of hot wax. This method originated in earlier times when the wax for large statues came from a negative plaster piece-mould that was coated with beeswax and backed up with a coarser type of wax kneaded on while still malleable.

In the sand-piece moulding process, it was shown how CO_2/Silicate sand and other self-setting sands had revolutionized this process which had been developed from sun or ovenbaked sand pieces or drawbacks through sand gullets backed with plaster. Economies in labour and the use of costlier materials had not always produced finer definition in the finished casting. Examples of portrait heads made by sand-piece moulding in past centuries showed detail and definition infinitely superior to lost wax castings of the same period. This could not always be said of today's process but, for the larger sculptures, where the requirement of line was a greater requirement than infinite definition, the value of sand-piece moulding was generally underestimated by the modern sculptor.

A discussion, as a result of questions from the audience, ranged over numerous subjects concerning copyright, editions, and conventional bronze compared with so-called "cold-cast bronze."

A new organization of sculpture founders, The International Guild of Sculpture Founders, had been formed in Europe. The aim of this body, which was growing out of an informal association of leading European sculpture founders, was to consider means by which the sculptor could be protected from the variety of regulations and practices in different countries.

The law of copyright was so diverse in its national forms that it was being studied on an international level

(U.N.O.). Editions of sculpture, or rather an edition that was accepted as a bona fide work of art varied between one country and another: 12 in Britain, eight in France, etc. It surprised the audience to learn that the legal requirement in the United States was ten and that, should an edition of more than ten (plus one artist's cast) be made, then all of the casts become classified as reproductions. (The basis for this ruling is the regulation covering the importation of works of art—a "work of art" being duty-free).

In France the T.V.A., or sales tax, is at a lower rate for "works of art." It was felt by European founders that this should be a basis for pressure to be exerted on all governments for all "works of art'. to be treated in a similar manner.

The use of the term "cold-cast bronze" could lead the sculptor to commit an offense in many countries where trade-descriptive legislation existed where such a material could be classified as resin-bronze and the former description was not acceptable.

SPACE-AGE KILNS AND FURNACES

Frank Colson
Florida

In the developmental stage of the United States Space Program, it was evident that it would be virtually impossible for a rocket to be launched off of its pad if its firebox was lined with conventional firebrick. Materials had to be developed with extremely high heat insulative qualities combined with practically no weight. Because of this need, great effort was made during the 1960s to develop and manufacture these new materials for space vehicles. Some of these sophisticated, high-heat tolerance materials were not readily available for application outside of the Space Program itself. Other materials, however, were easily adaptable to such industrial markets as steel tempering furnaces, boiler insulations, glass-conveying roll covers, and reactor insulation. Born to meet specialized needs in the space program, these space-age materials can often replace traditional refractory materials.

As an individual who stands apart from the industrial market, the artist-craftsman may be the last to learn about application of the new space-age refractory materials. Unable to afford the time and money spent by industry to research and develop applications for such materials, the artist-craftsman, nonetheless, stands to greatly benefit from adapting these space-age materials to his own personal use. The purpose of this paper is to make the sculptor aware of the many possibilities for using these materials in kilns and furnaces.

What are the new materials and how do they work? To date, there exists no comprehensive catalogue or bibliography of space-age materials. In the few short years they have been commercially available, these refractory materials have undergone a great deal of development and improvement. It is important to know the materials currently available on the open market, and to understand their basic differences.

Among the most available and diversified of the new space-age materials are the alumina-silica ceramic fibers. Although there are several other types of ceramic fibers made from zirconium, quartz, and other minerals tolerant to high temperatures, the alumina-silica fibers are the most easily available and reasonably priced. Weighing 1/40 the equivalent volume of firebrick, these materials have a normal heat exposure range of 2,300 degrees F. New fibers containing 20 percent more alumina have been developed which have a working temperature of 2,600 degrees F., well within the potters' heat range for stoneware temperatures. One manufacturer is presently developing an alumina-silica fiber with a heat tolerance above 2,600 degrees F.

Alumina-silica based fibers occasionally have small additions of soda borax or zirconia as modifiers to make the material more stable.

Another family of ceramic-fibers is one based on the composition of zirconium oxide. Zircon is used extensively in the ceramics industry as an element by itself. It is also used extensively in refractory compounds and as an alloying agent in nuclear reactors. Its melting point is extremely high. The manufacture of zirconium ceramic fibers requires high temperatures, and, as a result, a sophisticated insulating material is produced that can be exposed to a constant heat of 3,000 degrees F. Such zircon based ceramic fibers are commercially available and are costly, but not all together prohibitive if application demands it.

A more sophisticated ceramic fiber is the boron-nitrate based material, which is extracted from kernite and borax. It has an extremely high melt point which makes it usable continuously at temperatures of 4,500 degrees

F. These fibers, the best of their type commercially available, are often used for nuclear reactor control elements, which is a definite factor in considering their use.

Among other ceramic fibers produced for their extremely fine insulating qualities are those made from quartz and nickel. These types of fibers are not available commercially since they are limited to use in components of space vehicles.

In every case, regardless of the mineral from which they are produced, the ceramic fibers have wide-ranging properties. They do not go through the physical changes of expansion and contraction when used within their prescribed heat limitations. They have excellent thermal insulation characteristics, low heat capacity, are light in weight, are unaffected by heat shock, show resistance to flame erosion, are chemically inert and, thus, are not affected by either oxidation or reduction firings. They are also exceptionally resistant to wetting, have no out-gassing, and are completely inorganic in composition. The manufacturer, however, will often put some organic binders into the material during fabrication in order to add durability for handling and installation, but these usually are made to burn out after initial exposure to heat. Other nonorganic binders help to maintain the shape and stability of the ceramic fiber during use. These nonorganic binders provide a wide range of ceramic-fiber forms.

Alumina-silica ceramic fiber products are produced by melting white alumina ore along with flint and borax glass to a temperature of 3,600 degrees F. in an electrical furnace. A jet of steam blasts the molten material as it is poured. This produces a fluffy white, bulk ceramic-fiber which ranges up to ten microns in diameter and one-and-a-half inches in length. This ceramic-fiber can be used to produce blanket, block, board, bulk fiber, casting mixes, liquid cements, felts, paper, spray mix, tamping mixes, textiles, tubes, vacuum-cast shapes, and numerous other forms. The ceramic fibers that are basic to these forms remain strong and resilient. They interlock to maintain structural integrity. There is no brittle structure to develop stresses during sudden chilling. This results in a superior thermal product which has flexibility of usage and application.

Although alumina-silica fiber was made experimentally in 1942, it was not until 1952 that it became available on the open market. Since that time, ceramic-fibers have been placed under numerous patents and countless different forms based on the composition and processes that have been developed in recent years.

The Federal Power Commission forecast a "severe crisis" of natural gas availability in the future. The Commission's chairman reported that there is no end to natural gas shortages in the immediate future and that "many large and giant new fields must be found and developed with regularity to improve the supply position."

Since ceramic-fibers do not require natural gas for production methods, as do traditional refractory materials like firebricks, it is evident that these materials will become the prevailing product available for the artist-craftsman to use in the construction of his kiln of the future.

The conventional approach to kiln and furnace construction remains rigidly based upon a long tradition and firing methods have been developed which are based on the use of traditional materials upon which known predictabilities have been established. With the use of new materials to achieve this same end, it becomes necessary to develop a very different way of thinking about kilns and furnaces. The function of ceramic-fiber products can be most easily understood when they are used as a secondary means of application in conjunction with traditional refractory bricks, since in this usage they simply improve the manner in which brick performs.

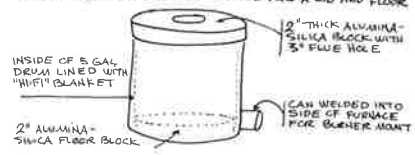
When kilns or furnaces are made entirely out of ceramic fibers, without use of brick, the pattern of reflection and retention of heat is different; therefore, it is necessary to understand and allow for these differences when firing.

Since ceramic-fiber thermal materials became available, I have been using them as an integrated part of many kilns and furnaces both for myself and other artist-craftsmen. First, I used the alumina-silica "blanket" as a partial replacement for bricks. This alone cut fuel costs to one-fourth, firing time to one-third, and labor and materials to one-half in constructing high-temperature reduction kilns. Later, in addition to the blanket, I used other forms of alumina-silica fiber materials in specialized areas, such as burner ports, fireboxes, flue boxes, and doors on kilns made of brick.

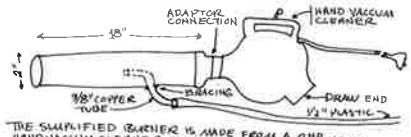
LIGHTING PORTABLE MELT FURNACE

PORTABLE MELT FURNACE & BURNER.

A FURNACE NEED NOT BE LARGE AND HEAVY TO MELT METAL FOR A NUMBER 10 CRUCIBLE FOR A ONE-MAN OPERATION. THE INSIDE OF A 5 GALLON CAN IS SIMPLY LINED WITH A COVERING OF 1" THICK "HI-FI" ALUMINA-SILICA BLANKET, AND A 2" ALUMINA-SILICA BLOCK IS USED FOR A LID AND FLOOR.



FURNACE BURNER.



THE SIMPLIFIED BURNER IS MADE FROM A 2 HP. HAND VACCUM CLEANER, ADAPTED, BLOWER END, TO A 2" LENGTH OF BLACK PIPE. A 3/8" COPPER TUBE IS PLACED INSIDE THE PIPE AND A 1/2" PLASTIC TUBE IS THE FUEL LINE.

FIVE GALLON MELT FURNACE

THE SCULPTURE WORKING PROCESS

Ted Bieler
Canada

This was a unique commission in the sense of the location and possibilities of scale and the freedom. I want to show you in some detail the kind of processes I went through in developing an idea for a sculpture that was possible to build on the site. The process was somewhat convoluted and went on over a fairly long period of time. I think there were a number of reasons for that. Perhaps the prime one was that it was an exceptional site, and I wanted to rethink a lot of the thoughts that I had been having about large-scale sculpture. So I went through a whole sequence of models for development of the piece. I think we will start right in with the slides and work from there in terms of the kinds of questions that arose.

I am going to start with several pieces that preceded it a few years earlier, to give you an idea of the kind of thing that I was doing up to the point where I got into the commission I am talking about.

The commission is located in Kingston, Ontario. These are pieces that are mostly in Toronto. This is about twenty-one feet high, 7-foot modules in pre-cast concrete. The two basic shapes are of the same concrete the building is constructed of. It is one of the largest modular pieces that I have done. I am showing these pieces in terms of a sequence of similar shapes used to create, in both of these instances, vertical pieces.

This slide shows working with the diagonals of the cube in three units can be restacked in any order.

That piece developed from this one, which is a sequence of 1-foot square blocks, based on their 12 separate shapes which represent all of the possible ways which planes can pass from one diagonal of a cube to any other diagonal of a cube. If you go through it systematically, you will find 12 possibilities that I used in a unique way in this piece. There are thousands of blocks which may be combined to create different combinations for different images.

This is a more recent piece, which is modular, and is simply two identical shapes turned to fit together. It is in front of a government building in Toronto. This is the kind of situation which is most common in Canada, and I imagine also here in the U.S.—sculpture is directly associated with a piece of architecture. In this case the base was designed by the architect and was in place even before sculptors were considered. In that kind of situation one has to deal with an architectural notion of where sculpture should be placed. I like the sculpture that I made there, but I do not particularly care for the site.

I would much prefer, in a sense, an open site such as this, which is in our back yard. Again, it is a modular sequence, one element composed of basically three hyperbolic paraboloid planes, composed of tubes with one element repeated five times in connected forms reflecting the individual element. So five times the one creates the first again. That kind of seed element crops up again in the piece that I want to talk about.

Now moving to Kingston, this is the site. I think that perhaps I was overwhelmed and challenged by the site. It is completely in the open. This is a breakwater which comes out into Lake Ontario just before it joins the St. Lawrence River. There are buildings at some distance. The harbor is on this side, and the lake is out there. The harbor is very old and is somewhat decayed. A lot of money was spent to rebuild it as the site for the 1976 sailing Olympics this coming summer. The harbor is now being

re-used, and so they rebuilt the breakwater. But the breakwater has a peculiarity about it, which is not terribly evident in these slides. It comes out from land in a broken spit, which breaks here, so that as you walk straight out, it moves at an angle of 60 degrees. At the end there is a triangular area, which is probably a total accidental occurrence. Some earlier government engineer, probably fifty or sixty years ago, made a triangular end to the breakwater. This very narrow part, here, is an extension of the breakwater, which is new. Basically, I had a more or less equilateral triangle. As I said, it was pretty much accidental, but it somehow defined and characterized that particular location. I will go into that, in some detail, later.

What you are seeing placed out there, is a sequence of shapes I made to try scale, to get some kind of notion of the size something would have to be, in that location, to be seen at all. There is a penitentiary blocking this side of the harbor, which is going to be torn down or changed, hopefully, sometime soon. This crane is 100 feet high, so you can get a sense of what the scale problem is. A hundred feet is not all that visible; what I have out there is about ten feet and is almost invisible. So the thinking that I entered into was based on the problem of how to deal with a site which basically does not offer any specific opportunity for comparison of size, one of the fundamentals Noguchi was talking about yesterday afternoon. How does monumentality in some sense relate to a relative situation where you can see something this big in relation to something else, or that has a particular quality in relation to something else? This "something else" that I am dealing with here, is an enormous horizontal plane, which is the plane of the lake.

Visible in this photograph is an island about four or five miles out in the lake (maybe a little farther than that), so there is a bit of a definition of the horizontal beyond just the edge of the water. This breakwater, at times, might be only a foot or so above the water level, so from a distance you see something which is almost sitting on the water. In order to view the scale, which in some sense came to mean "size" in that location, I started to consider the whole problem of structure. In the first place, what kind of structure would have the potential for creating something on a large scale? Among the other questions which were raised in my mind in relation to the site were, basically, how I wanted to simply create a focus on the view, a focus on the lake. The city, Kingston, is fortunate in the sense that it has not turned its back on the waterfront, as many large metropolitan areas have. (Interruption.)

I am describing the working process that I went through, developing ideas on scale and so on, for a large sculpture which I was commissioned to do for Kingston, Ontario, located on Lake Ontario where Ontario goes into the St. Lawrence River. It is a town of 50,000 people, and it faces the water. They have not turned their backs on the lake; they have some elements which focus on the lake. The sculpture is to be on the end of the breakwater which closes off the harbor where the sailing Olympics will start. What I was getting into was the problem of dealing with the size in relation to that particular site, since there are no comparing elements. There is just basically the horizontal and the sky behind it—the horizontal of the water and sky.

Picking up my train of thought, two things occurred to me. One was that I wanted to create a form which basically would be some kind of visual interest, a focus, which would not necessarily block the view. I wanted something transparent, some kind of window, some kind of frame (in its most mundane sense), of the view out into the lake so that people's sight would be drawn to that point, but not as a focus in the sense of a distraction from what was around it, but rather as an opening out into it. In other words, my idea was like going through the eye of a needle out into the large space as a kind of over-scale to the natural surrounding where people tend to look at things in which they can relate to their own scale. The great horizontal expanse of the lake, which goes out for miles and miles, is somehow awesome. I wanted people to focus on that and not necessarily on the sculpture.

There were two possibilities. One was to create something which was totally transparent and perhaps even formless. The early stages were, in effect, an attempt to create something which would be like a cloud using the tetrahedron, which, in fullest terms, is the perfect structural element and is absolutely rigid. I wanted to change the densities so that you would have, like in a cloud, areas of transparency, more or less. This was an idea that I had been working with on other pieces. I wanted to create something which would be transparent, would change in density, and would not have any particular outside definition, just as a cloud can have a fairly vague outside definition. In the early stages, as I went through a series of cardboard models such as this, I began to discover, obviously, all things about the tetrahedron which I did not know before. I think that you can theoretically know about geometric shapes. But until you start actually putting them together, you do not really understand them in any depth. I certainly did not.

I made hundreds of these little cardboard tetrahedras and started stacking them. One of the things that emerged was that they tended to stack in a kind of tetrahedral form. In other words, when you put more than a few of them together, they start to create their own shape. This is something I have worked with in other sculpture. It was difficult to create a completely loose outside shape, and it was difficult to create something which went out and came back in again. It tended to form into something which got smaller as it went up and which, in a sense, was almost opposite of what I wanted.

I will go through a sequence of slides of the early model, in which I was thinking of what would happen when people would come close up and look through. How much would it basically become a geodistic structure? How much would it become just simply another structure which relates too much to engineering and not enough to an open image. In order to test the scale in which the tetrahedron might work (and I was still involved in that idea), I made a number of plywood models in the shop, painted them, created a connecting system, and moved them out to the end of the breakwater. I then began to stack them in different arrangements.

This form goes to about fifteen feet high, and from a distance, that was not enough. One of the other things that started to happen when I put them together was that they created larger tetrahedra: the clue to what should happen. The kind of shape that I am dealing with is not just the tetrahedron in the sense of the outside edge, but I used a series of planes in order to change the densities, so one area is very thin in comparison to another. To make units change in density and retain the same kind of system, I simply used a web which goes to the center. If you bring these all the way in, they come to the center. As I worked with this basic element, I became more and more fascinated with just that element.

I also decided at this point to work in aluminum. The reason was that aluminum would tend to disappear under certain circumstances, which also related to the whole notion of a cloud form, an undefined form. Under certain light conditions the form would almost be invisible. Under other light conditions, you would see only part of it; some facets would tend to

reflect the light; others would disappear. The city would have cloud covers during certain parts of the year. The gray aluminum without sun against the cloud cover and against the frozen lake, would tend to disappear. That is just an element of how to create an aspect of change. I painted the models gray, to get a sense of how they would tend to disappear against this kind of light.

I realized from putting these together on the site that the larger tetrahedra are really more exciting and far more visible from a distance. I was not too happy with what a lot of small ones were doing, so I decided to experiment with the largest scale and put larger units together. I moved through a cardboard phase and then to a fabricated element in aluminum itself, primarily for sales purpose. I realized that after going through those initial studies of putting elements out on the site, that the budget was not sufficient to build a large enough sculpture. In order to create something out of the scale the site called for, I knew, intuitively, from past experiences, that I would not be able to do it with a budget of $50,000. That is simply not sufficient to build a thing of this scale out of aluminum. Even steel would have been out of the question. I decided to go to Alcan, which is an enormous aluminum smelting and rolling company in Canada, and ask them for the metal. In order to do that, I felt I had to do a very "together" presentation. I worked out a relatively simple technology, which required putting aluminum together with epoxy on this kind of scale. This is a model (one inch to the foot), which stands a couple of feet high. Then moving from this original scale to elements which are 8 and 10 feet on the side rather than 3 feet, I worked in a system where basically I was working with 3-foot modules. As they rose in elevation, I criss-crossed them and created this thing which somehow was a finer scale as you viewed the top and larger in scale as you looked towards the base. There are some views which I think are quite exciting.

What happened with the tetrahedron from the various points of view is that it became a square. A tetrahedron fits inside a cube. One can, in fact, fit two tetrahedra inside a cube when they are allowed to occupy some of the same space. From some views, it becomes a square; from other views it becomes completely triangular; and from others, they are in between.

Going back to selling the idea to Alcan; I took my plan to an engineer, who ran it through a computer in order to get some sense of the possibility of building that kind of structure. He did a fairly brief computer analysis to get a reading on whether or not the structure could stand. I did a series of simple working drawings and a series of tabulations of the kinds of lengths of welds which would be involved, the area of metal and the weights of metal and so on, so that when I went to Alcan, I could say that I would need so much of such thickness of metal and be able to take it to a welder and ask, "How much would that cost to weld up?" I was not sure how much money it was going to cost. I knew how much metal was in it, and I knew how much welding was involved; with that information I could get a cost estimate from the fabricators. I took it to Alcan and they bought it overnight. They looked at it one day and said, "Yes," the next, which was a most exciting kind of response that one could hope for from a large company! It was simply a matter of getting the right people together, and I had some help from people of Kingston to do that.

There are a series of three pieces Kosso Eloul did, one of which is being presented this afternoon. Another one was done by a French Canadian, given by the government of Quebec, and the one I did was given by the federal government. All are to mark the 300th anniversary of the founding of the city. There is a kind of auspicious monumental aspect to the project, which obviously helped in the selling of the idea to a large company.

This is the final model which is being built. What actually happened after presenting the model to Alcan, which I have just shown, was that they bought it. I went to fabricators, and they were talking about $150,000. Alcan decided that they would just give the metal, so I was at approximately $70,000 to $80,000; there was no possibility of going beyond that.

In the previous model there was a little over a mile of welding. There is about the same amount of metal in this piece as in the last one, but the fabrication is simpler. In the previous one I found it was O.K. to fabricate all of the elements. That was not a major problem, but as soon as you take these elements down to the site and try to connect them at 25 feet, 30 feet, or 50 feet, you are into enormous cranes, highly skilled erection people who get paid a good wage, and a lot of very complex problems of balance and direction, which I discovered involved an enormous amount of money. As soon as you get off the ground you are into money. We were into the range of $60,000 to $70,000 just to erect the thing so that the building of the piece was feasible, but the erection was completely unfeasible. I began to reconsider the whole notion of whether or not, in fact, it had to go up that high. I simply dropped the project for a month and started to re-examine the basic shape of a tetrahedron, with the elements going towards the center.

Another problem was that one cannot make a single plate of metal at that kind of scale, 33 feet, without buckling and being structurally impossible. We talked about making a hollow beam with a wide section either on the inside or the outside. I tried both and liked it on the inside, as it tended to frame this negative space on the inside in such a way that it somehow held that space tighter; the actual thin outside edge had the aspect of creating a lightness in shape so that the heaviness came where the tight space definition was. That was a structural decision which was made, and when I started playing around with proportions, I realized that it was a very exciting shape that all of a sudden emerged. In other words, I moved from an effect probably of overdependence on structural considerations to a consideration of what is a monolithic element. What is a monolithic shape in space? I grew more fond of this basic element that I had started with from the beginning. With the addition of this, somehow it became modeled; it became form rather than a flat plane, and by dealing with the edges, it somehow took on a very solid feeling.

I have been specifically resisting the whole notion of making hollow volumes. I have a strong resistance in my work to making shapes which are basically volumes defined by surfaces, and from the beginning I wanted to avoid that. I ended up doing that, but not really creating a shape which somehow reads as a volume; it reads more as a solid. The aspect of its being a wedge somehow reads as a solid rather than as a volume. The aspect of the whole tetrahedron defining a volume somehow breaks away from the notion of any one part of it defining a volume. The decision, then, went very quickly from there. The notion of making a 33-foot one was based on working out what kind of proportions I wanted, and 6 feet was the maximum size they could roll, so I developed these dimensions in the fact that that was the maximum dimension you could roll in metals. It ended up being 32 to 34 feet. I picked on 33 and went from there to 22, which is two-thirds to 11, which is a third of that and half of this,

to 44 inches, which is a third of this one. There is some kind of a feeling in my mind for that particular order. Just a couple of views of this, and I want to show you the drawings, then we will take another more extensive view of that model.

This is the site plan, the triangular end of the breakwater. If you begin here, there is another 60-degree bend to here, so the whole notion of "60-degreeness" and the whole notion of "tetrahedral" eminates from the site. I consider that as an extension of my architectural inclinations, but basically it is a consideration for the dynamics of the location. I tried many different ways of putting it on and decided that this kind of dynamics worked the best. Lining that up with the division of this angle results in this triangle. The line here is a railing. The edge of the breakwater drops right off into the water.

I will go through these working drawings quickly. Simply, each tetrahedron has one size of plate that forms the whole thing. The plate is all 3/8 inch scale. Alcan said that since they were going to roll a special alloy (or an alloy which is not so commonly available) which would hold up under the watery conditions, they wanted to roll all one thickness. This was more convenient for them. That had certain kinds of connotations that I will go into in a minute.

About the geometry, I researched a mathematics library. I was hoping someone would tell me what this angle was, but that information was available especially since I had a width which created an odd angle where the plate had to be cut. I went through a very pragmatic process of taking a tetrahedron, stringing it up, and trying to create a whole series of right-angle triangles which could be solved with simple trigonometric functions. I purchased a trigonometric calculator and looked up the tables. I had had trigonometry in high school; it was not a fresh subject. It took me a couple of days to sort it all out, to find this angle. I went to the engineer afterwards, and he said that was exactly what he would have done. I think we tend to have too much of a sense of awe of what practical mathematics is all about, but it is basically a process of working it through.

I worked out a sequence of drawings which allowed me to get competitive bids. I think, on a project of this size, that is important. The cross sections through the beam elements show how the beam elements connect, the kind of weld I wanted, and the way I wanted it ground down so that the palte was at right angles and continued rather than making it a half-round connection in its dimensions. With one tetrahedron, which helped in terms of visualization, I was able to take the drawings to three or four companies. (A number of companies were interested, but only a few were capable of doing it.) I got a couple of quotes and chose one which happened to be from a person who had worked with sculpture before and was much less afraid of it. By being in a position to obtain competitive quotes, one is in a stronger position to get a good price.

I got a price for the fabrication, which included cutting the plate, welding it together, taking it down to Kingston and assembling it there. The sculpture at this moment, in fact, is being put together this week while I am here in New Orleans. It will be assembled in Kingston in three or four weeks. The larger elements are all pre-fabricated. I made an accurate model in order to get the total aspect of how the form would be connected and how it was to relate to the concrete jetty.

I think there are a number of qualities at the site which, since I spent so much time on them, I should point out. One is that I wanted to separate the elements from the ground and from each other so that there

was a 4-inch gap from the concrete up to the element and a 4-inch gap between the elements, which created a fairly major structural problem and had to be reinforced on the inside.

Aluminum, 33 feet long, will expand one inch with the variations of temperature in Canada. There had to be a slip-joint here (which was not a reason for getting it off the ground, but was a good reason for having it off the ground), so that the whole structure could expand and contract on a track and not buckle or twist because of the elements.

As for the aspect of the crystalline nature of the project, I didn't want, necessarily, to get into any kind of jewel-like connotation, but there is a series of kinds of references there. For instance, water, when it freezes, forms crystals which are in 60-degree relationships to each other. We have a tendency, when we look at a snowflake, to think it is flat. It is not flat at all. There is a whole series of elements which are all 60 degrees, one to the other. The sculpture is on a watery site. It is going to reflect the water. This whole area, in effect, becomes a kind of water reflector. We checked on that and found that the water will reflect and create a movement over this whole surface. The sky will be reflected so that you get in the space in the middle, a kind of mingling of the elements, and somehow, that separation of the elements from the horizontal creates one more kind of transition from the ground to the other elements. The other thing that happened, of course, is that the tetrahedron on edge creates the active element. We will see in a minute some of the tetrahedrons being built that are in the other direction. They look like the pyramid; they look solid. As soon as I flip the thing on its edge, it becomes an active element. That is a traditional way of dealing with the actives. In the history of painting you deal with the diagonal if you want an active element.

Moving into the fabrication: Here is an aluminum plate started to be welded. They are connected by pieces of angle iron, which are bent and bolted so that they make up the individual beams, first in the triangular cross section, then they are bolted together and welded, and the weld is ground. And so we have a soft transition from one plane to the other. I have questioned that. Basically, in my mind I wanted a sharp line there. Technically, there was really no way of doing that and doing it so that you would have some guarantee of the line being straight. You are dealing with the negative. These come together on the inside corner; it is much easier to deal with outside corners than inside corners when you are finishing metals. Anybody who has tried it will know. So then the fabricator, in effect, came into play here and said, well let's try one where we fill it in to make a transition of that kind, which makes it possible to use grinding drums. In my own mind it took me a while to switch over, but I am very happy with it now, because it creates a more modeled kind of shape rather than a fabricated kind of shape. In other words, you get away from the notion of the predominant slabs when that kind of connection occurs. All these edges are broken, as well, so that the thing doesn't come into any sharp corners.

That is the 11-foot element, and they are grinding away at it. It is an enormous job. They have been working all winter on putting them together. I think I was extremely fortunate in the fabricator I got. I offer one piece of advice, which has been corroborated by many sculptors I know, who have worked with fabricators. The prime factor is to work with somebody that you feel is going to be enthusiastic about the job; otherwise forget it, because of the hours and hours of tedious work. I, myself, could never build a sculpture manually. I would not have the patience. Those people spent hours and hours welding,

grinding, because they are into that. They are excited about the quality that they can achieve. Really, it is absolutely essential to get somebody who feels that way about what he is doing.

These are just to get an idea of scale of the big element. They are 6 feet by 33 feet long. They were welded together in the shop, transported from Toronto to Kingston, which is about 150 miles, and are now being connected into the tetrahedral form right on the site. In fact, they had to wait until now, because it has been too cold. It is all MIG welded, manual inert gas.

The 11-foot unit and the 4-foot unit are the only two elements actually put together in the factory. They are the limit you can transport down the highway. I actually considered completing it in Toronto and moving it by barge, but that was enormously expensive, so we decided to do whatever we could and do the rest on the site. Since it is such a job to move it around, they finish each corner that is accessible, and then they flip it and work on the next. In fact, on the site they will completely finish each corner and then have a crane flip it and do the other corners. It has to be flipped about four times.

The other thing that I wanted to get into was the obvious enormous problem in dealing with a strictly geometric shape. I recognized the problem but went ahead with it anyway. I think part of the reason I have gone ahead with it, and I feel quite confident about it, is that the tetrahedra is an extremely three-dimensional form. If you are dealing with a rectangular shape, a shape with 90-degree angles at the corners, there is always some kind of reflection of the possibility of that simply being a projection of a two-dimensional surface. We have been conditioned to deal with the visualization of form in space, basically on a 90-degree grid, and if you switch your frame of mind into a 60-degree grid, which again is one of Fuller's time ideas, you move into a situation where there is, in a sense, four dimensions rather than three dimensions. This was a situation where I have had extreme difficulty being able to visualize that shape. In other words, being able to rotate them in my mind and to put them together in different ways, just in my imagination. It took almost a year of fooling around with that shape before I somehow could impose that grid on a normal learned grid which is a 90-degree grid. That aspect, besides the aspect of the three-dimensionality of it, simply does not allow one to predict exactly what is going to happen next as you move around. The fact that the shape is hard to conceptualize and hard to tie down in your mind, somehow creates a dynamic which requires participation in movement around it and creates the kind of three-dimensionality which requires direct experience as opposed to the kind of Gestalt notion of minimal sculpture where you can understand it from one view. I don't know if I have covered everything I had intended to cover, but I will answer any questions that people have. Yes?

TOM DILLINGER, CALIFORNIA: I was wondering if your purpose in invention of three-dimensionality has achieved its purpose? I noticed that the forms have a real two-dimensional quality when seen from both sides.

BIELER: Yes, they do.

DILLINGER: And are you trying to defeat that?

BIELER: Not necessarily defeat, but to confound it. I think one of the most interesting aspects of sculpture is the aspect of things shifting from a two-dimensional level to a three-dimensional level. I do not know whether that is necessarily a sole purpose, but one of the problems is that this is simply a two-dimensional thing which simply projects into a three-dimensional thing. With rectalinear forms you have a notion of what it is going to look like from another side. However, with this thing it does appear flat from certain sides. It is very obvious that it moves from a triangle to a square to in between. Therefore, from some sides it is very two-dimensional and on other sides it isn't, and you cannot predict, which is probably the thing that I am talking about. I think it is exciting to move from the two-dimensional to the three-dimensional, but if you can predict from the two-dimensional what is going to happen three-dimensionally, that is where I think it is not so interesting.

WALT REDDINGER: I have some fairly long questions, but I have to make some comments first. I think that your presentation is an articulate one and the question, in fact, is the whole presentation. As a sculptor, I feel that this presentation is very successful and exciting, but I am wondering about one area where there might be other sculptors who have the same concerns. The architect can easily relate to the work, because you are dealing with the language of geometrics, etc., that sort of thing. But what happens to the sculptor, and I am asking you as one sculptor to another, who is working this way? How do you see the type of presentation that might not be exactly like the kind of work you have, where you are talking to architects and you are not just dealing with the sense of the architectural environmental process but, in fact, are dealing also with the phenomenon of subject connotation? What advice would you have? Maybe I am asking the wrong person, but I am trying to stir interest here. Do you sense that you had an easier time presenting your ideas because you can deal with the linguistic shape, form, amalgamation of space? What does the artist do who has concern for an ideology?

BIELER: Without getting in an attempt to defend, I question how much to get into that. I could get into it very readily. I have always been fascinated by geometry. I have a love for geometry. I have explored this in a lot of works, and I do not think that it has a lot to do with architecture in the sense of architecture as practiced in terms of building buildings. But there is another element of architecture that I think most people tend to forget about: Architecture is, in fact, a division in space in terms of its foundation. Architecture, if you forget about building systems and all kinds of buildings that we see around and you take it back to its core, it has to do with the division in space from the ground up, if you like. It has to do with the nature of structure. A supreme example of that philosophy is Fuller's latest book which is really not strictly geometry, it's not strictly structure. It is philosophy. He calls it the geometry of thinking. Another notion that I present there, is that people have different qualities of mind. I wonder sometimes why I was not a musician, because, composers work in a much more kind of mathematical way than a lot of artists do. But why apologize for that? Why not let sculpture do that?

REDDINGER: I am not trying to pressure you, but why doesn't philosophy, for instance, include a frame of mind or philosophy that the site person or the architect find alien?

BIELER: What you are saying, in effect, is that by working with those geometric forms, the architects are going to tend to accept that without too much question. I think that you are quite right. And since I have got half the battle done, I don't even have to explain. I do not think most architects really understand that. There are some that do, obviously. What the fundamental notions are, are not necessarily common knowledge, but the whole aspect of the symbolism of the water and the use of the triangle in its vertical position as a symbol for fire gets the amalgamation going on and so on. There is a whole esoterics behind it, but going back to your question, I think that it somehow still relates a lot of notions

which can be articulated to architects, e.g., the whole notion of mass, which is evident in your work, or the ambiguity between mass and surface, which is evident in your work.

REDDINGER: Have you found in dealing with your own presentation that there are certain times that, in fact, you do not talk about these kinds of connotations, and you sort of hold back?

BIELER: Yes, sure. I resist that. I think, trying to bring it back into the particular context of this Conference, that yesterday, for instance, the panel was discussing what the nature of monumentality is, and everybody was running around the question. One of the things that came up was the notion that a monument had to be a person. We live in an age where, in fact, the kinds of orders which are interesting, are not necessarily the orders that are put down by Alexander the Great or Napoleon, but the orders that have been discovered through science, through art, because art and science are much more intermingled than most people are aware.

REDDINGER: Do you talk this way also, to the architect?

BIELER: If I have to, sure! I just want to finish that one thought or maybe it is already finished, but the whole notion of the subject does not need to be a person. The subject can be the discovery of the nature of the interrelationship of the elements, the nature of structure, for instance, which is a universal determinant and so on. Yes, you must talk about those things.

DAVIS, CLEVELAND: I should like to ask a question in regard to structure, the dimensions for your large unit. Would you give us the dimensions of cross section of the large beam?

BIELER: The cross section was 6 feet on the web, and on the inside width, it was 18 inches.

DAVIS: And what about the thin lip?

BIELER: The thin lip is three-quarters of an inch—very thin.

DAVIS: And all joining to the plates?

BIELER: Two 3/8 inch plates.

DAVIS: Was that welded?

BIELER: Yes. It is welded all along, a couple of times, and then ground down, flat.

UNIDENTIFIED: What kind of a track did you use, or are you going to use one?

BIELER: There are just two plates of aluminum as small as I could make them. In one the bolts go through and the other has the holes drilled long so that the thing can slide, one on top of the other.

PAUL MANTELL, CHICAGO: Do you expect any maintenance on this piece?

BIELER: I have the fantasy that Alcan may do some maintenance, since the reputation for their metal is "up for grabs," but Kosso has an aluminum piece in the same kind of environment, and when you look close at it, it is scratched; people have their names on it and nonsense like that. You look at it from 20 feet and it disappears. I do not think it matters.

MANTELL: It has a tendency to gray?

BIELER: It does gray, yes. In fact, when I expounded my philosophy of reflectivity of the material to the Alcan people, it was the first time that I ever heard an aluminum man say, "What are you talking about? It is going to turn black in a few years." They will never say that to anybody. The only way to get around that is to anodize, and it is too big to anodize. Alcan came up with an alloy that you can clean every once in a while with a solution. I think the city will probably do that.

UNIDENTIFIED: What are your feelings about the rather substantial reduction in scale that you wound up with? And the other is on welding. You had the rather long runs. What is the relation between welding costs and the surface costs?

BIELER: It was interesting. I went to two companies; we talked at length. One company had done another piece of welding for me in stainless, where you run into real problems, and they had not had as much experience in aluminum as I thought they did. Anyway, they were into whole water baths, complicated things, that they were going to use. I went to another company that worked with aluminum all the time, and they did not even raise the question. It didn't buckle at all. They simply used a string from one end to the other, and they tacked all the plates to be moved back and forth so that they came staright; there are no heat problems at all. It is amazing! I think that it is important to use a thick enough plate; 3/8 inch seems to be a critical dimension. If you go to 1/4 inch or thinner, you get buckling. If you go to 3/8 inch, it seems to have the ability to spread the heat quick enough. It is MIG welded. I thought it should have been track or machine welded, but only one company had that kind of equipment, and they were not too interested. We just decided to do it by hand.

UNIDENTIFIED: You talked about cost. Can you tell us what the welding costs were?

BIELER: All the aluminum was donated. The fabrication, which is cutting the plate to size and welding it together, grinding it down, moving it out to Kingston and erecting it there, which included the cost of cranes and so on, was $43,000. That was the lowest quote I got. I got higher quotes. Fortunately, I got the lowest quote from the company that I really wanted to work with. The metal was around $25,000 to $30,000. They never put a price on it, but going to a warehouse, it would have been $30,000.

UNIDENTIFIED: Will Alcan have that particular alloy available for future projects?

BIELER: It is one of their standard alloys, but it is not normally stocked in very many sizes by their warehouses.

UNIDENTIFIED: It was a Toronto firm that did the welding?

BIELER: Yes, it was done in Toronto. I wanted to do it locally, but there was no company big enough in Kingston. I think it would have been worth the company's while to get the equipment and get the experience, but then I would have had to go through the whole educational trip. I might have known more than they did. I really felt that I was worth $43,000 to get people who knew what they were doing, and anyway, I am not sure that I could have done it any cheaper by doing it myself.

UNIDENTIFIED: How about the scale to size?

BIELER: I don't know. I will have to see when I get it down there. My rationalization for that was simply, that by going up in stages, one dealt with the direct experience of working with people on the site. In the sense that one was smaller, one was about the size where, if you were walking under it, you would be in the middle of the inside space, and then it gets to an indefinable size. I don't know. I will just have to see. I think it is big enough.

UNIDENTIFIED: I will briefly say that when you meet a man like Ted Bieler and you are a young sculptor, you realize that to achieve a sense of responsibility separates the men from the boys.

THREE STUDIES IN COMPUTER GRAPHICS TECHNIQUES APPLICABLE TO SCULPTURE

William A. Fetter
Illinois

Since pure computer graphics applications in sculpture are under exploration, this presentation reviews three computer graphics and other hardware systems which appear to have future usefulness to innovative directions in sculpture.

Three projects in development by the author are designed as generalized capabilities; however, they have application to sculpture in both design and presentation. These are a computer graphics-based Human Figure Animation System, a Hemispheric Projection System and a Virtual Image Display System. Some of these projects under way at Southern Illinois University at Carbondale were initiated by the author during his pioneering work in computer graphics at the Boeing Company. All have been supported by the SIU-C Office of Research and Projects, the Department of Design and/or the National Science Foundation. New or renewal proposals are currently under review. Each emphasizes the graphic display aspects and assumes that interdisciplinary techniques and talents will be employed in conjunction with these systems.

Each of the techniques is developed to be integral with working software tools developed by the author called: an eight-step approach, a visual module system and an orientation graphics system. Application may be made to such purposes as design, evaluation and presentation of sculptural concepts. The author encourages comments on these efforts to help assure their productivity and usefulness in a range of aesthetic and technical applications.

One study should ultimately yield a means for sculptors and others to explore human figures, in motion, in groups as described below as to background, current work and extrapolations.

Study of design applications of computer-plotted human figures is currently under way. Supported by a National Science Foundation Grant, special emphasis is given the capability to display economically a variety of levels of detail to parallel the different scales employed in expressing the human figure.

A crude ten-point figure can be adequate for expressing a mass of figures and simulating movements of groups. A 100-point figure can be animated to show overall scale with overall anthropometric dimensions described. A 1,000-point figure, similarly animated, can be useful in the study of gross spatial relationships.

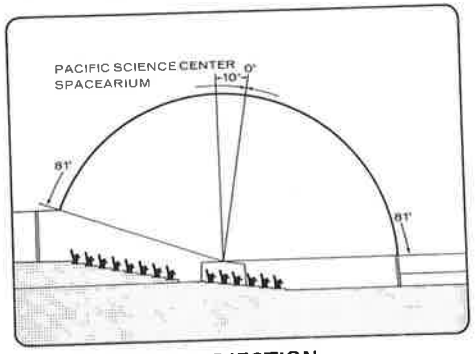
1000 PT. FIGURE William A. Fetter

Extrapolations of this order-of-magnitude approach ultimately should achieve complex data bases and a program which automatically selects the correct level of detail for the need, and which should permit visualizing the human figure.

One study which offers the ability,

for example, to simulate monumental sculpture effects in its intended environment, is a wide-angle projection system.

There are a number of planetariums in the United States and Canada which display stars in their true relative positions on the inner surface of hemispheric-shaped screens. Many planetariums and similar general audience science centers also have 70mm motion pictures projected by special lenses to similarly display science films in wide angle for a greater effect in other types of presentations.



WIDE ANGLE PROJECTION

Running parallel with these developments is the growth of animation by computer graphics for a wide range of technical and aesthetic subjects in which a true perspective sequence of views is a valuable asset to perceiving, evaluating and acting on information. While at the Boeing Company several years ago, this author directed the development of a computer program, proposed to permit computer animation in wide angle for aircraft vulnerability studies and an air-borne command and control station. Now at SIU-C, he is directing development of a similar computer program for other applications and invites recommendations from potential users and sponsors for the most productive development of this capability.

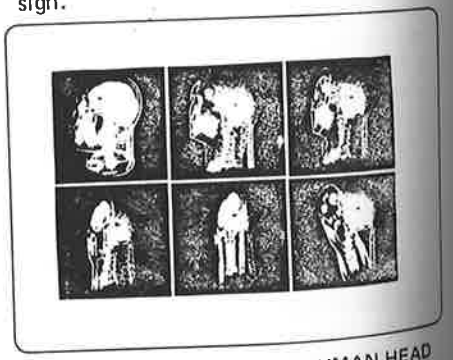
Currently, a research grant is in review to move forward with test presentations prior to full animation.

One system under study was originally developed using medical cross sections to provide what appears to be a three-dimensional object in a small volume.

The starting point here with a prototype hardware device was designed to produce an apparent three-dimensional object in a 2 x 3 x 4 inch volume. The device is floor-mounted and is approximately four feet high. The stimulus material is a 63-frame loop of 16mm film which may economically be produced by computer graphics techniques tested earlier and currently in development by the author.

The prototype device uses a technical approach similar to experiments conducted by the author at the Boeing Company with subsequent interaction by Fetter and the inventor, R. L. de Montebello, in the late 1960s producing a virtual image of the *Boeing Supersonic Transport* fuselage design. Because of this past association, the instrument is loaned to the author for further mutually productive experiments and grant proposals. Research proposals are now in preparation for sample applications fo the current capability and for extending the concept to interactive systems and larger swept volumes.

While the illustrations represent the volume of a human head, it can be useful, for example, in expressing any three-dimensional sculptural design.



HUMAN HEAD

MONUMENTAL SCULPTURE AND SOCIETY

Martin Blaszko
Argentina

If we were to ask a sculptor what his motivation for creating an artwork might have been, it is unlikely we would receive a clear answer; indeed, the artist might not recall in detail the stages of his ideas. From the theory put forward by some poets that "art should be a reflection of cosmic sources" to Freud's theory that art is the "sublimated expression of repressed instincts," the most varied and contradictory thoughts around the problem have been formulated without a satisfactory definition being produced.

Although we may find it difficult to see clearly the beginning or end, the observation of some stages of the creative process provides eloquent illustrations in naked simplicity of the dynamic and urging disquiet which permanently resides in the artist's mind. The search for an anxiously desired order and the necessity of feeling himself integrated in a complex reality (social, economic, environmental) provokes in every human being latent forces that create forms which could satisfy those needs. The dilemma of harmonizing personal and social interests is a source of continuous tension. But sometimes a common denominator is found and, on the level of aesthetic appreciation, there is almost a total agreement on values if high quality is involved. No doubt the notion of a home does not end in the haven of our intimate life which is an apartment or a room. The street, the neighborhood, the village or town in which we live are the continuation of our houses, and we require that this expanded idea of home also produce an aesthetical emotion to satisfy our need for beauty. We realize the extent of the stimulating power of an urbanized environment by walking along the streets and across the parks. A well-organized environment, whether private or public, has the power to provoke certain emotions that affect us deeply. Thousands of years ago this need to nourish, also through the public contours, led mankind to create notable works of art which were integrated into the natural surroundings or into the urban context.

A city or a village often elicit admiration because of its orderly design. Many medieval and Renaissance towns are an authentic testimony to this effect. The aesthetical aspect, forever present in human creation, is quite independent from the functional purpose. In fact, we tend to underestimate certain emotional aspects if these are associated with financial factors. To wit: in purchasing a garment, we never disregard the aesthetical factor, and when we are faced with two alternatives, we will never buy something if the color and design are not to our liking, even though it may be less expensive than the main choice.

It is worthwhile emphasizing a usual phenomenon: the dichotomy of the common man when acting in two different sectors, the private and the public or social. His concern for his personal appearance and the objects that are close to him, from his car to his last piece of furniture, is a strong motivation for him to devote a large percentage of his income satisfying his emotional needs. However, the criteria change radically when the same person serves the community in the capacity of a public administrator.

To begin with, his concerns as an individual are forgotten. The emotional aspect of the work he plans, designs, and builds in towns and villages is left aside, as well as the harmonic integration of those elements surrounding the work. The consequences of this contradiction are the economically powerful urban conglomerates whose wealth of material is over-

whelming but whose emotional content is poor. The miseries of modern civilization have limited the field of plastic arts to the museums—something that has never happened before. Although this particular nearsightedness does not preclude the production of work which responds to authentic, intensely-felt needs, in other ages and in different countries many of the beautiful undertakings resulted from the creative ability of public men, architects and artists. These masterpieces still provoke admiration and become the secret link connecting us with the world. From the prehistoric Carnac alignments, the Egyptian monuments, and the creations of ancient Mexico to the Renaissance, there is a great number of works conceived specially for an urban or landscape integration. These works symbolize the creative capacity of society. A common vision of the world, which produces a certain structure, a *style*, made people join in erecting temples, churches, cathedrals, aquaducts, etc.

Today this effort, to synthesize in a special structure a common valid denominator of our vision of the world, is still going on. In an article written in 1968, "Sculpture and the Principle of Bipolarity," I tried to make clear my personal view of this problem.

If the characteristics of our age can be synthesized in one notion, perhaps the concept of contradiction would be, for me, the most adequate. During the 20th century, many artists attempted to create a plastic structure equivalent to some basic ideas. Piet Mondrian, for instance, saw our universe as a harmonic, static, and well-balanced conglomerate in equilibrium. Antoine Pevsner had a vision of a continuous movement, dynamic as a process of growth. A very interesting book, *The Authentic Person Dealing With Dilemma*," by Sidney J. Harris, reveals hidden aspects of man's self-image and of his attitude towards the world. Visualizing common tensions felt by every human being perhaps should be the goal of modern-form creation. This presupposes a clear identification with general ideas and not with personal whims. The rhythms and the proportion within a piece of sculpture, therefore, must be a faithful copy of our feeling towards the world.

The monumentality of a sculpture is not only a question of height, it is a matter of the inner organization of the form and of the sensations the artist reflects in the sculpture. A man who lacks the feeling of the real relationship between his person and the universe, will be unable to make a monumental sculpture, because the vision of this relationship is distorted. We often see huge sculptures which are not monumental because the vision of totality is distorted and the result of this is an expression of megalomania, since the artist sees himself, sometimes, as the center of the world. I agree with you that all the ideas or theories an artist might formulate will add nothing to his work and that the only eloquence which really counts, is the one of the work, if it is there.

I think we should start projecting the slides, but before this, I should like to mention the advice Elie Faure gave to his readers. He asked us to analyze our aesthetic emotion with our sentimental emotion, and our sentimental emotion with our aesthetic emotion, because this could help us get a deeper understanding of the meaning of a work of art. It took me some time to understand this advice because it sounds rather complicated; but it is not. If you have contact with a person, you have a special impression, a sentimental emotion or you may like or dislike him. There is a wide range of human aspects about this person that produces a number of sensations in us. If this person is an artist, you will be able to relate the characteristics of his work to this impression, and it might enable you to better understand the aesthetical aspects of the work and its meaning. Yesterday our colleague, the sculptress from Korea, confirmed my interpretation. She told me that after talking with me and exchanging impressions about art, she is now in a position to better understand part of my works she had already seen in slides. And now let us project the slides.

By way of final remark, I would like to repeat what has been said before. Our cities must be purified and embellished with monuments reflecting the experiences of our time and fulfilling present emotional needs of the individual. Today's sculpture is unique when the environment becomes a source of aesthetical emotion, hence the importance it should be assigned in the architectural and urban planning when urban remodeling and landscaping are underway.

KOREAN SCULPTRESS: I should like for you to explain the inner feeling and the purpose of your forms.

BLASZKO: Behind each form or style, there is a special kind of feeling i.e., the Egyptian style and the Greek style are based on a special mood of organizing the composition. The lines which define the structure are put together according to a special *Weltanschaung*. Each system of composition is a synthesis, the formal analogy of a specific vision of our universe.

In our century two major efforts were made to conquer such a synthesis. One was made by Piet Mondrian whose dominant goal was to express a sense of harmony, equilibrium, and a static order. His structure is based on the composition of vertical and horizontal lines dominating a clean and pure rectangle. The other effort was made by Antoine Pevsner, whose vision of our world and our feelings toward reality was translated by dynamic and oblique lines, expressive of a continuous movement. His vision was that of a process of growth. For me, the world in which we live is a conglomerate of contradictory forces and I am not sure about this definition; sometimes I have doubts about it. In order to have a clear idea in this respect, I often make some tests to avoid an arbitrary interpretation of reality. Asking people, periodically, regarding the event which produces the most excitement today and by observing reactions, one can conclude that sports events create one of the most intense of emotions that people feel generally. This experience is basically the play of opposite forces. The principle of antagonistic, contradictory forces or, however you may want to call it, can be found on different levels and in all fields. The other aspect is related to the notion of monumentality. Sometimes there are small pieces of sculpture which provide you the sensation of "monumentality." You feel that they are big and, on the other hand, you sometimes see huge sculptures which you feel are very small. This was the point for which I requested an explanation by the panel last night at the McAlister Auditorium.

Yesterday we participated in and enjoyed a multitudinous hommage for two great sculptors, Isamu Noguchi and Seymour Lipton. The meaning and value of their work have a very positive social effect. Art is perhaps the most efficient means to visualize the dynamic interaction and dependency between individual and society. Therefore, I do not agree with the definition that our age is an antisocial age. I think this is not the correct description. I personally believe that our age is a social one. We can see it here, now, with some examples.

Many people in New Orleans, who had no close contacts with modern art, are contributing their efforts to the success of the Conference. At this very moment, 240 million Americans are celebrating the Bicentennial, a very important social event. They are identifying with their country. How, then, can you call this an antisocial age? If in this country a man is out of work, society supports him. You have now in New Orleans hundreds of sculptors who are working to enhance the public environment. This is not an example of an antisocial age.

No matter how very different the groups may be, there is always a general

consensus about the quality of work. This phenomenon makes us intensely feel the secret and harmonic links we have with society and nature. Consider Egyptian sculpture with its small pieces which give a special kind of feeling, a sense of monumentality. Where is the point? Why is that so? My answer is that the proportion within the composition of the work—the relationship of the parts in the structure—gives you a feeling of your location in the cosmos i.e., the distance between us and the universe. A nondistorted vision of this relation may enable us to find the formal equivalences. Every form we produce reflects us; we project our whole personality into the sculpture. When you see yourself as the center of the world, when you think that you are bigger than you really are, you can never do a monumental sculpture. However, if you see yourself in the right proportion within the cosmos, you can create, perhaps, a monumental sculpture. This is my opinion.

I shall now show a film produced 16 years ago. It presents forms and rhythms of a more primitive conception. Rather than talking about its content, I prefer you to view it.

FILM.

UNIDENTIFIED: Can you explain further the question of monumentality? I believe just the opposite. You said if one feels his ego as the center of the world, he cannot do a monumental sculpture. Sometimes you have very good proportions and well-balanced parts. What has this to do with monumentality?

BLASZKO: A good proportion and a well-balanced composition are not enough to give a sense of monumentality. Greek sculpture has outstanding proportions. Some reliefs by Phydias are great. Perfect! But there is no feeling of monumentality. In fact, the Greeks felt themselves *as* the center of the universe, the Egyptians did not. The proportions must transmit a certain kind of feeling of the relationship between man and cosmos in order to give us the sensation of monumentality. A projection towards the world might be the attitude which enables this characteristic, and our age imposes such an attitude.

KIT IMHOFF: Are the works shown in this film related to the other sculptures which we saw in the slide show?

BLASZKO: The characteristics of the structure are the same.

IMHOFF: Can you say something about the sense of the works and about the differences?

BLASZKO: The changes are caused by a more intense experience of life. Although the method of composition did not change, one can observe an evolution of the style by noting new elements which were added without altering the essential meaning of bipolarity. The movement within the work is more complex and perhaps overcrowded. You can see from the first work to the last a change from simplicity to a complex totality. It seems analogous to the biological evolution.

The development of a form is a long-lasting process. Sometimes a language is developed over hundreds of years. Piet Mondrian worked several years on one painting. A piece of art which grows slowly, lasts longer. A work conceived in the morning, finished during the afternoon and sent to the dealer the next day will surely last only a short time.

Thank you very much.

photos next page

RITNIOS CENTRIPETOS Martin Blaszko

JUBILO Martin Blaszko

Lila Katzen, Moderator
Elizabeth Catlett, Mexico
Helen Escobedo, Mexico
Luise Kaish, New York
Elza Mayhew, Canada
Athena Tacha, Ohio

LILA KATZEN: This morning we are given the incredible task of discussing sculpture of the future, and we have a number of very important things to concern ourselves with. One of the most important questions is addressed to Helen Escobedo. There have been many attempts to bring sculpture to the people. An excellent example of this is Mark di Suveros' exhibition in New York City, and another is Louise Nevelson's work placed first at an entrance of Central Park, and placed now on Park Avenue in New York. Do you think communities in the future should select works for public situations that exist in their neighborhoods? If so, what should be the criteria? Should it be aesthetics, political expression, useful function, participatory, or environmental? This question is not just for you, Helen, but for anyone who wants to talk with us about it.

HELEN ESCOBEDO: I will answer it, but remember that we are talking about tomorrow because what I am going to say does not apply to today. We will face the problem of education, a visual education necessary to make future generations aware, enormously aware of their surroundings. It is difficult enough right now, to convince just one person to give us a job on this scale. Now, if we must convince a whole group of people, we will have a lot of trouble, unless they are properly prepared. Ask them to think about ugliness and the necessity of sculpture being a total part of the environment. My answer to that question is that we must have a functional environment where the audience can participate, where the public, the children, whoever is surrounding it, can relate to it. People relate far better to something they can become part of rather than to something they must look at.

KATZEN: Yes, Athena?

ATHENA TACHA: I can answer that, too. The New York State Arts Council has found a temporary solution to that problem of participation by the audience in the decision, the choice of the sculpture. They are starting a series of commissions and have a pilot program now, just started in Smithtown, Long Island. The Council is commissioning a large 'sculpture park' (an environmental sculpture) and have asked a committee of critics, museum people and an artist to select three appropriate sculptors for the spot. The sculptors, I am one of them, have presented to the public of the city our maquettes with proposals for the space. The public is going to vote and select one of the three who will get the commission. In other words, the public does not choose the candidates out of an infinity of sculptors, but they have a say as to who will be chosen from that limited group; I think that for the moment, this is a good solution.

ESCOBEDO: I hope it works.

KATZEN: I, too, hope it works. I have another question which is an important one that we should discuss at this time, so I speak to you, Elizabeth, and ask this question. Minority groups, such as women and Blacks, are not usually given the opportunity and responsibility to produce and exhibit public works. Do you foresee more opportunities for these groups, and will government and private aid establish funds to realize these opportunities? What means of selection should insure these opportunities?

ELIZABETH CATLETT: I think that this question refers specifically to the situation in the United States. It is not a condition that exists in many other countries, and as I said yester-

day, there is a different situation as far as women sculptors in Mexico are concerned.

KATZEN: We would be very interested in hearing about it.

CATLETT: Why don't you talk about it, Helen?

ESCOBEDO: Although we have had terrific discussions about this issue, and I do not feel that this is a problem in Mexico, yet. Our problem, however, is that there are not enough women sculptors compared to men sculptors. There are two hundred men to, perhaps, ten women. So the choice is going to fall, with the law of averages, on the male population. As far as I am concerned, and I think I speak for Elizabeth and all others here, we are not lacking in opportunities because of our sex. It has more to do with the quality of the work.

ELZA MAYHEW: I find that it is the same in Canada. I have been working there for eighteen or twenty years, and I actually felt like a preferred citizen. Sometimes I felt that I had the edge on men because I have felt absolutely no discrimination. Any sculpture that I wanted to make, I could place, and as I say, I felt I was receiving preferred treatment. I never felt discrimination at all.

KATZEN: How do you feel about this Athena?

TACHA: I do not find this situation in the United States, frankly. And I suspect that the fact that ten women and two hundred men in Mexico have reached the point of professional sculptors, tells of the society's structure, where women and men are channeled. For the women who now succeed professionally in the United States, there has just been a token effort on everyone's part to give them some opportunities. Even now we have not reached equality. I think.

CATLETT: Can I add something to Helen's statement? One of the reasons we have fewer women in sculpture is that women have not had an opportunity to develop, but on the basis of the future, there are many more women in the art schools. When I entered the university art school, there were no women teaching practical courses, only art history. And that was in 1958. But now we have almost as many women students as men students in the art schools. The difference that I find is a sort of competitive feeling. I think there is more cooperation between the men and the women sculptors in Mexico. Do you have that feeling? Do you notice this?

ESCOBEDO: Definitely, especially since women have become more liberated in recent years. At present they are going to art schools and not worrying about bringing up 12 kids. They are having two or three, and so they have more time and are beginning to dedicate themselves to their "own thing." Therefore, there will be more women in art schools, and consequently, more women teachers and museum directors. Practically all the museum directors in Mexico now are women. It's fantastic!

KATZEN: Louise would like say something.

LOUISE KAISH: I am reminded of a joke that dates back to the time when I was studying art, when someone would ask what are you going to do, or what are you, the painters would respond, "I'm a painter." And the other person would ask, "But how are you going to make a living?" However, if your answer was that you were a sculptor, he would say, "What's that?" Now I think that this is very significant of the vast explosion of interest in the visual and plastic arts in the United States. With this has come an active participation on the part of women. But there have always been women sculptors, and in the United States, I have never felt actively discriminated against because I am a woman. In my student years I did spend a year in Mexico, and I must say, that despite all the liberation that you speak of, the position of women in Mexico when I was there, with few exceptions, was in the cocina. I think American women have enjoyed many opportunities and will enjoy a great many more.

CATLETT: I was waiting for somebody from the States to answer the other part of the question, but since no one has, I will get into it. It has to do with minority groups, such as Blacks, Chicanos, and others in the United States. One of the reasons that they are not usually given the opportunity and the responsibility to produce and exhibit public works is that their existence is sort of denied. In art books, in history of art classes, there is no mention generally of Black art, of Chicano art, of any other kind. So it has been a struggle on the part of principally Black artists themselves that they are recognized as existing. In historical instances, where art by Black women sculptors has existed in musuems, it has been relegated to the museum basement. May I ask, how do we get it out of the basement, and how do we get the artists into these opportunities? I think a conference of this kind is a good starting place for the future. You might bring in more Black artist; You might have some on the panels; you might have some expressing to the other sculptors their point of view and why they have these problems. Since there is no one here to speak for the Black artists in the United States, pardon me for taking up this extra time to do so.

KATZEN: I think that this is very important, and I am happy that at least we have gone on the record as relating to the issue.

MAYHEW: I will make a rather foolish remark and say that I am totally in sympathy with this, and I think it should be considered the next time we have a sculptor's convention. But I would say that it is not only Blacks who are in the basements of museums. I am in some museum basements and have been for 14 years.

KATZEN: Elza, I want to ash you a question. In your opinion, can public art in the future become the domain of the people and be a humanizing element in our cities, without falling prey to the lowest common denominator of aesthetic concern?

MAYHEW: Can it, did you say? This is the great ideal. This has always been the ideal for anybody who works in sculpture that goes outside. For some reason it has not happened in the last few years, except in certain cases. I think it depends on who chooses what art and where it is placed. Who places it? Who is going to be responsible for the toal environment? The subject came up a few minutes ago about neighborhoods choosing their own art for their own places. What qualifications are those people in that particular neighborhood going to have for choosing art? If the standards come up as we hope, art will truly function as a sort of spiritual, elevating influence in the community.

ESCOBEDO: We must remember that we are talking about art "tomorrow," and the most important question is one of education. If we can sensitize the public, they will be perfectly capable of deciding what they want. They are not, today however.

MAYHEW: But we do sensitize them by arranging for marvelous art situations. They see it and they know that if it makes them feel good, this must be good art. It is, of course, not just exposure. It is getting the right things in the right places. It should perhaps be chosen by artists.

ESCOBEDO: Exactly what the panelists were talking about yesterday: the scale within a scale. The size does not matter so much as what we put in it, and how that relates to what is outside. It is an environmental problem.

KATZEN: I have a question for Louise. We know that the museum is a public space in which the sculptor's work is regulated by the architectural environment and the aesthetic preferences of the curator. Do you think this differs in any way from the architect/sculptor relationship? Do you foresee a time when there will be a difference?

KAISH: I believe they are two totally different things. I think the artist is a doer first, foremost and always, and the critic and the curator are the arbiters of power and taste; some of

them exercise it responsibly and some of them do not. I see in this country that the art museum, per se, is becoming a theatre, in effect, for it is almost impossible for a curator today not to see that his position—in which his concerns are with vis a vis critics and other curators—is bound up with the avant garde. And that means always being or trying to be there first with the latest thing. I do not think that this necessarily relates to the artist as a doer, or in terms of what we were speaking about, or what the panel was speaking about the other day in terms of monumental sculpture, or sculpture in the open. Their very size excludes them from being exhibited properly in museums. As a doer, you cannot concern yourself with what the walls of the Whitney or the Milwaukee or the San Francisco museums look like.

KATZEN: I was talking about the physical sense, primarily. The museum, in terms of its architecture, does have an effect environmentally upon any work that goes into it. There is the Guggenheim, for instance, in which almost every sculptor who has ever been shown there, suffered quite a bit from that space. I think Calder is the only one who, in any way, ever beat the Guggenheim as a pincer movement on sculpture. I am referring to the building itself, and the curator who will select and arrange the sculpture. There have been many noted arguments between sculptors and curators as to where their work should go. In a sense, these are similar. This is why I am asking the question. At any rate, I feel that it has a similar relationship to the sculptor/architect relationship, in the sense that the architect is situating the sculptor's work and saying "Don't make it too big; don't make it too small." "Make it of steel; don't let it rust. It'll stain the sidewalk." "No sharp edges; we don't want people killing themselves on it." There is a kind of control that exists inspite of the fact that the sculptor or the artist is the doer.

KAISH: But aesthetically in the architect/sculptor relationship, one relates masses and forms and shapes in a specific environment. At the same time you are doing the thing that is dearest to your heart. Hopefully, you are not going to change your "angles" because the architect does not like them. But in a museum, your sculpture is there just temporarily. Even if it is in a permanent collection, it will be moved.

I think a good example of how the "museum effect" is not working, is the fourth floor of the exhibition at the Whitney Biennial in New York, where these extremely avant garde works, seen one against the other, have no environmental context and hence, tend to negate one another.

EXCOBEDO: From the architectural point of view, we all would prefer to work with architects from the word "go." But this business of sticking something on at the end is what I am absolutely opposed to, and, I think, that applies to all of us. If an architect wants a work, and if he starts with a concept that it will be part and a function of the building, then we started out right. We have reached the point where we refuse to stick on something at the end, and to cooperate with someone who says, "Here's a nice little niche, why don't you fill it?" I will make my own niche, thank you! And if it can be constructive, well, so much the better. But this is the same problem with the museums, I mean, the concept of our museums, not the old, full-of-stuff museums. They have to exist. There is the British Museum and the Tate, which both have marvelous collections. But for the new museums, we must have a new concept. They have to be open and empty with movable walls. I agree completely with the frontal opening towards the public, rather than towards the museum, lest they become one more ego trip for the curator which they often tend to do.

KATZEN: Do you prefer your work in a museum or out in the open?

ESCOBEDO: Out in the open every time.

KATZEN: Does everyone here prefer her work out in the open rather than in the museum?

ESCOBEDO: It is too precious in the museum. I never work for a show in the museum without feeling constricted, especially when doing a large environmental piece.

MAYHEW: I think there are two kinds of sculptors. The most prevalent one today is the artist who wants to work with the architect from the very beginning. But there are still some who do a different kind of work, in that they do not want to bother with the architect; and I am one of those. But I must say I have trouble in sizing my works. I make them and sell them afterwards, if I can afford to. I am on an island out there in the Pacific, and I am there by choice. I do not feel a bit isolated because I travel a lot. I make what I want, generally. I have completed several commissions, big ones, and have had no trouble. The architect knew my work was rather consistent so there was no problem.

KATZEN: Do you have trouble placing your work?

MAYHEW: They are all placed terribly. But I feel they can stand it. They are just going to be there anyway. There is one thing I might add at this point. For the last two years, I have been a consultant on a committee for the buying of British Columbia art. This was a totally new idea of the N.D.P. government. A Provincial Committee for Art for British Columbia was set up. Its members were either artists or people directly concerned with art. Centers to view artwork were set up in Vancouver and Victoria, and in outlying areas of the Province. We traveled there in search of artists whose work might be worthy of purchase. We were allowed from one to three percent for all government buildings; there are a great many going up in different parts of British Columbia. If the cost of a building is only a million dollars, and since you can not get much for ten thousand, that is where the three percent comes in. We, of course, also have in Canada, the Canada Council and Art Bank. In fact it is estimated that Canada has larger available funds for artists per capita, than any place in the world. The seven artists on the committee first got to know all the architects and all the artists. Then we chose various artists for particular buildings. This is something I don't think has been done anywhere else. We had, maybe, twenty-five buildings going up. We became familiar with the artist's work. They had a three-hour session with us, and we said, "Wouldn't this be great for so and so's work?" The architects never heard of the artists, and the artists never knew of the building. We are getting along extremely well with this. I know that the Canada Council and the Federal Department of Public Works in Canada, which is also one percent for public buildings, does not work this way. They have a list which anyone can get of all the public buildings being constructed. And it is up to the sculptor to lobby. Canada, you know, is rather big, and to go down to the east and lobby is difficult. But in the British Columbia plan, the committee is fascinated by relating particular artists, painters, and so on to particular buildings. We have had long talks with the architects, who are delighted because they are learning more about sculpture at home.

TACHA: At what stage do they relate or match them to artists?

MAYHEW: As soon as the buildings are posted with plans.

TACHA: In other words, the plans are made first.

MAYHEW: Well, the plans are accepted by the Government. But they are changed. We get in at the preliminaries, but not before the building is accepted.

ESCOBEDO: Well, the ideal situation is when the whole maquette is planned out, and you assemble. Artists, the architects, the urbanists, the gardeners, get together to figure things out right there on the models, and decide who must do what, where, and derive a total view of the project. Then have

the public, a sensitized public, come in and say, "Do you like it this way, or do you find these colors offensive?"
TACHA: But that is not the way it is done. The architects build the building and after it is built, they look for a sculpture of the kind they have in mind for a particular spot. First, that immediately limits the choice of sculptors with whom they can work. Secondly, they tell you what you are going to do.
KATZEN: I must add that there is the real architect who does that.
TACHA: What percentage?
KATZEN: Very small. I am involved with an architect now in a situation where I have been called in at the beginning for the inception of the concern for the building, even before the building was laid out, which is rare. I never had it happen before. It's a marvelous feeling!
MAYHEW: In this particular case in British Columbia, the architect does not have the final say as to which artist is used for his building. He may suggest a particular artist, and the committee will give open consideration to his idea, but the final choice is made by the committee.
KATZEN: By the way, before we open the floor for questions, I think it is very important to bring up some concerns in terms of sculpture tomorrow moving on from large scale sculpture, monumental sculpture, or public work as we wish to call it. I think the question must be asked, and I ask it of everyone here. It is something I think concerns us to some extent. Do you envision the sculpture of tomorrow as being more media oriented? In what way would media work, such as television, film, tape, video, performance? Do you think this will transform our environment? In your opinion, do you consider it sculpture?
TACHA: I do consider performance art sculpture like form that exists in real space. For instance, Rockne Krebs' laser beams are sculpture, in my mind. They are immaterial sculpture, but that is still a way of dealing in real space. Video works are, of course, two dimensional usually except for Joan Jonas or some other video artists. I think such types of art will develop further and further, but I do not think that sculpture that is done with materials will cease to exist since there is room for both, and there is need for both.
KATZEN: Does anybody else have a comment?
ESCOBEDO: Yes, I hope that it will achieve integration, total integration as it used to be, where sculpture became literally part of the total building. I see little real difference between painting a canvas and painting a door, except that the door opens and closes, and you walk through it as a functional thing. Basically the idea is that everything we build can be beautiful. It should be beautiful, whether it is the concrete finishes or whether it is the acrylic and the plexiglass. This total integration is what I hope will happen.
KATZEN: Do you think new materials as they come on in the ma rket will change our attitudes?
ESCOBEDO: I certainly hope so. We have to experiment. We have to use these materials with the function behind them. We have to learn how ot use them sothey can be use within their context.
MAYHEW: Yes, these things must all be experimented with to a certain degree. The only thing I think I can add to this panel is the slight difference as things are happening in Canada, if you think that is of interest.
KATZEN: I think we will open to the floor for questions. Please come to one of the microphones, identify yourself and by all means, please feel free to to ask any questions at this time. We have no questions from the audience?
CATLETT: I have a question.
KATZEN: I think the panel is entitled to all the questions it wishes.
CATLETT: I should like to raise the question, since this is an international as well as a national conference, about the Western domination of sculpture.

KATZEN: What do you mean by the Western domination of sculpture?
CATLETT: I mean not just sculpture, but since we are discussing sculpture, I put it into those terms. I mean the domination of European and United States ideas as to what "international" art should be.
KATZEN: Do you want to answer this, Athena?
TACHA: Well, this has to do with the future.
KATZEN: I agree, it does have to do with the future.
TACHA: I think there is a tendency for moving ideas between the East and the West, between so-called underdeveloped countries and developed countries, and I think a kind of international style will emerge soon. It is starting to emerge now. We Westerners pay more attention to the art of the other countries, and they absorb ideas from us. So I think that although the domination still exists, it might level out after a while. Also, since this is a women's panel, I think the fact that more women have managed to reach the level of professional artists and have pushed their way to the top in terms of getting articles written on them and getting into important exhibitions, and getting important commissions—getting into history, in other words—I think they will influence more and more the international scene. Perhaps a new style will emerge that will not be only male dominated and conceived by male teachers who teach both male and female artists.
ESCOBEDO: We are getting women into the schools, too.
TACHA: Little by little, but we are still very much behind.
KATZEN: Was there a question?
VIVIAN FORWECTER, NEW YORK : There has been, of necessity, so much discussion of architects, architecture and architectural environment by our sculptors here. Understandably, the panel cannot answer this question, but I am sure it has occurred to many of us here. Would it not have been, and will it not be in the future, more productive if in dialogues of this sort, we can have the architect present? Whether there will be disagreement, hostility, or agreement, at least there would be a dialogue to which the audience would be privy. I am wondering how the panel feels. Would you like to be involved in a dialogue with the architects?
KATZEN: I think everybody here would be. I have just one comment to make in reference to that. I was in a dialogue with an architect at the architectural league of New York not long ago. It was called "Mechanisms of Collaboration." This was a total disaster. And I mean total! The architect, who was the moderator, was incredibly hostile.
FORWECTER: Well, Lila, one battle doesn't lose a war, and I am sure that he would not take the position that the conference was one disastrous confrontation between a sculptor and an architect. It would seem to me to be a healthier, more productive, more informative situation.
KATZEN: I think we shall let the panel answer that.
TACHA: It would be marvelous if we could have some such occasion, though it probably would be difficult to organize. I have had experiences similar to Lila Katzen's. The architects look on us as the poor relatives. I mean, not only women artists, but all the artists. We are the last consideration in the building, absolutely, and I do not blame them, since they have very tight budgets, and they first have to make the buildings stand. First things go first. But on the other hand, I think they need education. They need as much education as does the public about art and the function of art. They are far from collaboration, such as in the Parthenon, between Ictinus and Phidias, or the cathedrals of the Middle Ages. That would be the ideal situation.
KAISH: I think that this is a very interesting point. One of the things that I would find of great interest

today, is a dialogue such as "Why sculptures are becoming more architectural and architects are building great sculptures!" It's extraordinary! In Houston, the Penzoil Pl. by Philip Johnson and I.M.Peis in Boston the John Hancock Tower. These are monumental sculptures while sculptors, in effect, are using architectural modules. The other thing that I would like to comment on is the preceding statement. I think the question of the media should be a very interesting one for future discussions because I feel that we are becoming cluttered with media. Media of today is a very abrasive quality in our lives, and we should be concerned with the arts in relation to and the introduction of media, since we have sensation and boredom as a result of it. For instance, we will not sit in a movie to watch a man sleeping for eight hours as the result of media. We will, on the other hand, dress ourselves and go to an art exhibition and watch eight television sets for hours that we would not watch for five minutes in our own homes. Now, the inter-reaction and the inter-relationships between architectural modular sculpture and media, I think, would make a marvelous panel discussion.

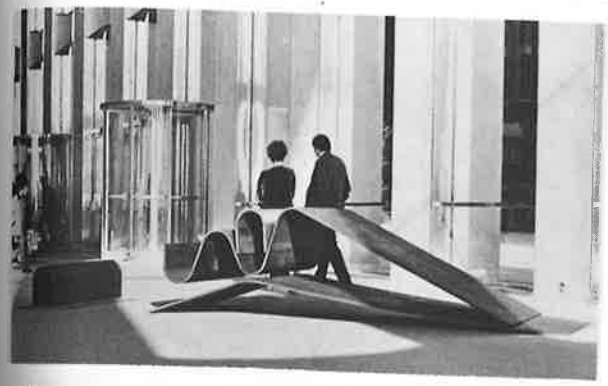
KATZEN: Can we have our next question please? It is getting a little late.

ED LOVE, WASHINGTON, D.C.: I teach at Howard University. Would Mrs. Catlett talk about the concerns of the artists in Mexico and the other Third World countries that I know she has visited. What is their thinking in terms of tomorrow.

CATLETT: I had prepared a long paper on this, but nobody will let me read it. I had two suggestions at the end of it. I feel that the people in Third World countries have had a long cultural gap, some of them, and others not so long, because of colonialism. They have been unable to produce culturally as national groups because they have had to accept serving others. I am not in favor, and people with whom I have talked in other countries, Third World countries, are not in favor of what some people have suggested to Lila, any kind of ethnic art. They want to participate in the mainstream of international art. I had two suggestions. The first was to artists of Third World nations. I hope that at the next sculpture conference, there will be many more present, as I feel that a lot of suffering and quite a bit of bloodshed have taken place in order for many people, probably the majority of people throughout the world, to find their place in our world system or our world setup. I think that instead of further clashes, what we want is further collaboration or working together. The first suggestion that I had for the artists of Third World nations, though they are already on the road of which I speak, is that we might bridge this cultural gap starting from our historical cultural base and creating through the use of modern ideas, modern technology, and modern materials, a sculpture with which the masses can identify and to which people of other cultures can find something to further enrich their lives while at the same time raising our cultural levels. For those sculptors and students from the United States and Europe who are here at the Conference, I suggest a conscious effort and insistence to understand, support, and include the contributions of Third World artists. It is necessary that you held with this. Those artists are attempting to contribute to a modern world so that the world will be enriched by our differences instead of being divided by them.

KATZEN: That is a wonderful statement, and unless we have some further questions, I believe this would be an apt moment to close our panel. I should like to thank everyone on the panel for your wonderful cooperation and say that while we do not have all the answers for sculpture tomorrow, we certainly have some of them. Thank you.

ANTECEDENT Lila Katzen



TRAHO Lila Katzen

SPIRIT Elza Mayhew

WHITE PASSAGEWAY Helen Escobedo

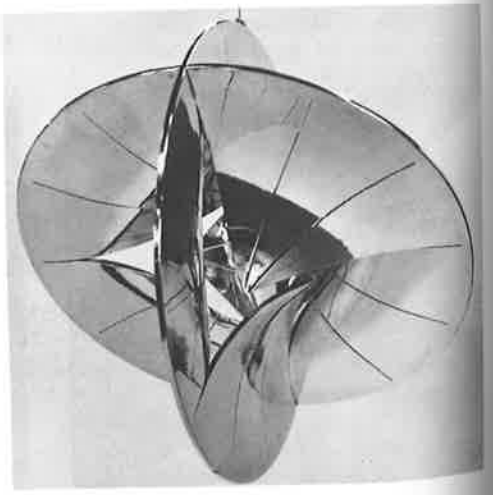
WALL AND CEILING ENVIRONMENT

DOUBLE TENSION ARCHES Athena Tacha

STREAMS Athena Tacha

COAST SPIRIT Elza Mayhew

HOLOCAUST Luise Kaish



CABALISTIC SPHERE Luise Kaish

INTRODUCTION

Irving Sandler
New York

Before I introduce the sculptors who will be making presentations today—Kosso Eloul, Clement Meadmore, Tony Rosenthal and Dimitri Hadzi—I should like to make some remarks about the nature of public art, its condition in America today, and perhaps, its potential future. It has never been a question whether federal, state or local governments should assume an attitude to contemporary art. They simply cannot avoid it. They can either encourage or ignore art. Aware that either alternative constitutes a position, governments throughout America have wisely determined to encourage artists. Their problem is to decide on the best methods. Aiding artists and groups of artists is unquestionably valuable. However, governments can do more. As agencies of the public, they can foster a public art, and by that, of course, I mean art in public places. To put it directly, a public building with art of excellence is a positive statement, affirming society's humanity. But how is a democratic society to achieve a valid public art? Certainly not by governmental dictation to artists, as has been and is the practice of totalitarian regimes. But by making it possible for a variety of artists (American art is distinguished by its pluralism) each according to his or her individual vision, to create for public places in the conviction that together their work will embody the highest aspirations of American society.

I should like to point out that the possibility of a major public art (major in that it engages America's best artists) is a relatively new phenomenon, not really possible until quite recently. About fifteen years ago public attitudes toward contemporary art began to change. Instead of being indifferent or hostile, large numbers of people became interested and sympathetic. Indicative of this change was the growing and knowledgeable coverage of the most advanced artistic tendencies in all of the media in response to public demand for information. The day—it was only some twenty years ago—when a leading popular magazine could call Jackson Pollock "Jack the Dripper," is long gone. Responding to the public's openness, artists since 1960, in marked contrast to the older generation (the Abstract Expressionist vanguard of the 1940s and 1950s), have tended to feel less alienated and to visualize themselves as integrated into society. Moreover, today's artists generally have turned away from the Abstract Expressionist ambition to embody subjective private experiences and visions. Many of them have adopted more objective concerns which often take into account the existing environment, stimulating thinking in the direction of public art. To put it simply, there has been a convergence of good will on the part of artists and the public and its representatives.

As significant as the change in artists' attitudes and styles has been, the change in the size of their works is a change prompted by the internal evolution of painting and sculpture. For example, artists began to face the problem of the pedestal. In the past the pedestal was meant just to hold a work of art. But contemporary vision began to consider it as a form, a sculpturally meaningless form, frequently larger than the sculpture it was meant to support. One solution was to get rid of the base and put the sculpture on the floor. But in order to be seen, sculpture resting on the floor tended to become larger prompting the creation of monumental works that lend themselves more to exhibition in public places than in private homes, galleries, and museums. This is but one reason. There is also the environ-

mental vision that today's artists seem to possess, but that is too much to go into now. I think you get the idea. The large size of much of contemporary sculpture and the environmental vision of artists generally have led to a variety of approaches to public art. I should like to enumerate some of them and quickly evaluate them.

There are small groups, one of which is called "Site," whose members consider the site of such primary importance that they literally make a work of art of the site itself. The attitude that considers art to be subservient to the site is a provocative one. But at this point, it is not of widespread interest to artists since it demands a degree of self-abnegation on the part of artists that few are willing to allow. Next, there are somewhat larger groups of artists, such as "City Walls," who prefer to create works for existing old sites, walls, roofs, rivers, etc., and who stress the work of art more than the environment. This approach that considers art for existing old sites can be very fruitful. At best, it allows the artist the freedom to choose sites that the artist believes would best suit the work of art, and then create a work for the site.

In addition, there are artists whose work is studio-oriented, but which lends itself to exhibition in public places. A considerable number of studio artists have received commissions to create works for architecture and are forced to think of such problems as the site, large scale, permanent materials, and so forth. There are several possibilities for artists in this category. One is the organic collaboration of artist and architect from the inception of a building. This would be the most desirable approach. The artist ideally will be able to shape the space in which his work will appear as he creates it. However, this approach has rarely succeeded. Architects tend to conceive a building as a total work and finish it down to the last door handle. Most of them seldom think of incorporating painting and sculpture. Even the few who are open to art will rarely risk an organic collaboration with artists. Architects have their practical problems such as the function of a proposed building, cost limitations, and local laws. They know that artists as a whole are not inclined to follow the boring research and to compromise with tight-fisted clients and committees who make too many of the major decisions. Furthermore, a leading architect who introduces art into his buildings, whenever he can, has said that for the first year or so he does not know what he wants to build; the last person he wants around is a strong-willed artist. I might add that the most desirable organic collaboration between artist and architect would entail the acceptance on the part of both of some ideal of an integrated art, such as existed in the Gothic Era. At that time there was a division of labor between "architect" and "artist"; the "architect" leaving unfinished spaces for the "artist" to provide works of art for, knowing that the "artist" would come up with Gothic art for Gothic architecture. Today, of course, there are no clearly-shared aspirations. This, certainly, is a problem that we must consider.

The most common method of introducing art into public places is to commission the artist after a building is completed or well on its way. This approach has the advantage of being the one most easily accepted by clients and architects. It is also the one that is most readily funded. There also are communities, such as Philadelphia, which require by law that a percentage of building costs (generally one half of one percent, or one percent) be devoted to the purchase of art. An alternative approach to commissioning artists would be to purchase existing studio works for architectural sites. This would be the simplest way of dealing with public art, but the least imaginative, since it does not involve an artist's creative consideration of the environment in which his piece will be placed, but rather leaves the aesthetic decisions of the suitability of the art to the site to someone else, a non-artist such as an architect, client, or builder. Today, public art interests a growing number of artists because of the tendency of their most exciting colleagues to work on a large scale. Nonetheless, there has been considerable opposition to public art. Many artists find unbelievable, if not disreputable, the idea of art as monument, holding that the notion of a heroic art is hollow, elitist ego-tripping. Others even reject the idea of art as objects. The number of anti-object artists is small, but they are vocal; their ideas have made a strong impact on the art world. I do not think that these objections are valid with regard to public art or other current modes of object art. The polemics of conceptual artists are valid only with respect to conceptual art.

The time is past when any single "ism" can believably claim to be the one fruitful tendency in art, *the* avant-garde tendency in art. This point deserves to be stressed. In recent years one artistic style after another has monopolized the attention of the art-conscious public. The belief prevailed that each successive style was avant-garde and constituted an absolute standard, no matter how transitory, that rendered all other styles obsolete. Value in art was made to depend on novelty. It is clear now that this point of view is outdated, and that we are in a time of pluralism. Increasingly, the uniqueness of an artist's vision and the artistry with which it is embodied in a work count for more than the alleged up-to-date character of the style. Not only does public art interest artists as never before in our time, but it also interests the public as well. Caring about the need to renew our cities and our environment, the public, including the artist, is becoming aware of the role that art can play in this. Art can be used to enrich the environment. Moreover, city planners agree that one way to provide a neighborhood with an identity is through the introduction of a landmark. Some are beginning to recognize that artists can be employed to create such monuments.

The experience of Grand Rapids is a good case in point. Brian O'Doherty, who heads the Visual Arts Program of the National Endowment for the Arts, probably is the person most responsible for the enormous contribution of the Federal government to works of art in public places. I cannot laud enough his efforts on behalf of public art. He reported on the effect of a major work of public art (that of Alexander Calder in the city of Grand Rapids) calling it "a model of the successful assimilation of a work of advanced art by a community which eagerly prepared itself for its reception. Matching funds were raised locally on a wide base, and the community's pride and the result is one of those civic virtues in short supply in the cities that have become arenas for random violence. The success of the Calder is due to the fact that different groups within the city found that it fulfilled their necessities. The art community was, of course, enthusiastic. The city's cultural leaders saw the Calder as a focus for various other kinds of cultural events. And the public was proud of the national attention the city received. Others saw the art work as a socially useful device for improving the quality of life. Some citizens concerned with urban renewal welcomed the Calder primarily as a major impetus toward renovating a downtown area. It is also possible to see the Calder as a model of the way in which a successful work of art can exercise those elusive moral energies we like to think attach themselves to the idea of quality, and so prepare the way, through practical education for community participation in more advanced art." So successful has been the Calder, that it is now the trademark of Grand Rapids, stenciled everywhere, most visibly on city vehicles such as garbage trucks.

What I am really talking about is the needs of artists and the needs of

communities and above all, of the interaction of these needs. What are the issues for the artists? As I see it, artists who work in public sites can generate a new content. That is, when artists begin to consider the cultural, social, political, and economic conditions of the environment in which they will work, these conditions may shape the meanings that artists desire to express—conditions that may suggest new forms and hopefully infuse new life into contemporary art, just as their paintings and sculptures, by altering the environment, may affect the outlook of the inhabitants. An artist's interest in the quality of people's lives and the manner in which his works affect them need not lead the artist to produce for a public. The conviction that art is at once self-sufficient and the issue of a personal vision by now is second nature, and for good reason; the contemporary artist prizes his or her freedom, his or her own ideas about art too much to allow them to be subservient to anyone else's dictum.

However, an artist can carry studio ideas out into architecture or into the city. The autonomy of art is thereby not sacrificed, although the artist's conceptions will probably alter in the process. If enough artists are enabled to work in public places, a new aesthetic tradition may develop, a tradition of a modern public art different from that of studio art. By the tradition of studio art, I mean that chain of styles which stretches from Impressionism and Rodin on. When the imagination opens up in the direction of public art, there will be disparate ideas, most of which will not survive. But a tradition will be started that will generate its own criteria of suitability, quality, and so forth. At present, a move by artists into architecture and the city is the only feasible way on a significant scale to integrate art, architecture and the urban environment. I want to stress that the process must be trial and error and will entail numerous failures; the alternative to a slow, improvisational evolution is an art based on preconceived plans. Fiats of any kind lack the believability to move artists today, or for that matter, most of the city planners, who are more interested in the ad hoc renewal of cities, rather than in dreaming up Utopian cities. There are, of course, a number of attitudes that artists who work in the city will have to change. Perhaps the sculptors on our panel who have faced them will talk about them.

The belief that art is precious is one of the things that artists may have to give up. Much of public art will be expendible. There will be the problem of vandalism. Many of the sites undoubtedly will be destroyed in the future, for cities are rapidly changing. Existing art materials may deteriorate, although this is less of a problem than a decade ago for an increasing number of artists are using new materials that will withstand weather. Furthermore, the public artist may suffer some loss of the privacy of the studio, particularly if he works in the site itself. But this and the limitations imposed by the site on the artists' freedom are all they need sacrifice.

What is the role of the community? There is a need for a dialogue between the community and the artist. I think it is here that we face the most difficult problem concerning public art today. If such a dialogue does not take place, a work of art, even of the highest quality, will not be successful in the community. The community on every level possible must clarify and present its needs, must educate itself, must participate in the choice of public art. This is a primary problem, and artists and governmental agencies must face it. Again, I cannot stress this point too strongly; if the community does not feel the need for public art as art and as a valuable contribution to the community, and the public does not become deeply involved in the work as it develops, then the cause of public art in America does not have much of a future.

In conclusion, it is clear to me that now is the most propitious time for a public art since the 1930s, because the public-at-large and artists generally have rarely been as sympathetic. Ventures into public art will be difficult ones; a great deal of failure is to be expected. But I think it is worth it!

Incidentally, this is the reason that Conferences, such as this one, are valuable, for they provide the means for the exchange and dissemination of information that will contribute to the success of public art.

SLIDE PRESENTATION

Kosso Eloul
Canada

It is very difficult for me to talk today because, actually, I would have been satisfied with one-quarter of the slides I am going to show you, except that there are three groups here—sculptors, colleagues and students. Students want information; sculptors don't need it. So, I shall try to speak as little as possible and show as much as I can.

This piece, *Time*, in Kingston is a "functional" sculpture because of the marriage you see under it. It is located on a new park where the St. Lawrence River comes down to Lake Ontario. The province of Ontario gave *Time* to the City of Kingston in celebration of Kingston's 300th anniversary. In order to do *Time* right, I had to turn to the Queens University engineers, bridge builders, marine engineers, and to Alcan in Canada to get a marine aluminum alloy that can withstand what the weather there can "dish out." Being an outdoor sculpture allows it to change moods with the seasons, with nature.

This is another sculpture in Florida. Patrick Lanhan is here, and I was very happy to put it on his grounds with his collection. These are two very early pieces, 1962 and 1964. In this one, my pre-occupation was with arches. It is an old pre-occupation among people: when one goes through an arch, he leaves the old self behind and comes out somewhat different. What kind of arch do you experience?

This started out as a project that never materialized, but it is the grandfather of sculpture in Kingston. There was a creek which I wanted sculpture around, through, and over. This is my model. Though it did not materialize, it was responsible for the one that did—this one. The model gained the acceptance for the sculpture.

Here I found that I had to do a system flow-chart in order to explain my requirements to the aluminum people, to the concrete people, to City Hall, to the Park Department, to lighting experts, to the contractors, and everybody else. This was necessary so that each one could relate to others in order to get the sculpture done and delivered to the city on time! The first row on the chart is the structuring, the welding and the manufacture of the aluminum at Alcan, Toronto. The second row on the chart is the concrete foundations on the riverfront where the ice could have taken my sculpture all the way down to Toronto if it were not correctly anchored. At the bottom of the chart is the City Parks Department, light installations and the grass, which is part of the sculpture. I learned the use of flow charts from a North American Aviation expeditor engineer in Downey, California, where I did a sculpture for the University of California at Long Beach in 1965.

At Alcan you see an ingot, especially chosen from marine-alloy to withstand the weather. It is rolled back and forth, back and forth; here is the alloy coming out as a manufactured sheet. Industry has been quite cooperative with the arts. I think that industry is my real "university" way, more than was the Chicago Art Institute in 1939.

At that time, I was working privately in a studio situation. When you work in that sort of situation, your sculpture is already finished in your mind before you begin. During the process you are making decisions even though you have to get engineering advice. You are taking on decisions that have to be made by you alone, because the engineers who are geared to efficiency and to saving money, will give you solutions that might cost you your impact. Actually, what we are dealing with is not material; we are dealing with feelings I think we are dealing with pride and

how to transform this into shape, form and material. Everyone sees it differently. The sculptor's job is to capture it the same way the musician does with music through notes. He, also, deals with feelings which he shares with his audience.

The sculpture is right at the foot of Queens University, and the head of the music department decided that they needed a contemporary setting for contemporary music. The City of Kingston is 300 years old and very beautifully Victorian. Since this is one of the few modern sites in the city, the music chairman decided to have his concerts there, right under the sculpture, *Time*, on the lakefront, a good example of the usage that was made of the sculpture. In Long Beach, a dance was choreographed around my sculpture, *Hardfact.*

Now, coming back to Montreal and the 1964 Sculptors Symposium, this is where I worked with stone. I was preparing to do just the stone when it dawned on me, that if you leave a stone in a park, it looks like a stone in a park. But, since there was a road there, I extended it to the stone and made my sculpture with a ramp. I achieved two things: one, you walk on the ramp and the sculpture is of an intimate size. Two, you walk under the sculpture, and then the sculpture is monumental. That ramp made the sculpture belong to the park, as if the sculpture were planned at the time the park was planned. Anyone who knows Montreal, knows that there is only one mountain in the center of the city and the people feel that the mountain belongs to them. I worked on site, and received some of my best art criticism right there from the sun and the shadows.

Hardfact, 1965, is the reverse mentality. After climbing all over my Montreal sculpture for eight weeks through the summer of 1964, it dawned on me that what I can build as a ramp, I can dig in the ground. Actually, what I wanted was a reaction to a very simple anatomical fact. Being tired of walking around on the solid floor with precisely the same eye level that I had had for years and years, I wanted to change my eye level. I wanted to go down into the ground, or up on a ramp and see the sculpture from different angles, with different eye level possibilities. Basically, I wanted to make it more than one piece, actually a multiple piece all wrapped in one. My thought was to put the sculpture up on a ditch so that you could experience going under it. I checked out this thought in Montreal in 1964 on a little hill. I used push-cans as a delineation and painted the hill red and black for emphasis. A little thought which actually produced this 135-foot sculptural ditch a year later, in a symposium at the University at Long Beach. When you walk into the ditch, you feel the ground on both sides pressing in on you, a good feeling. I felt my shoulders count. You can see the sculpture from different elevations. I was trying to do something that was so three-dimensional that from every angle it would not be the same. Every two steps would force you to visualize it differently. The trench at the beginning is very narrow, at times 18 inches, then it spreads out to 15 feet. This slide shows the innards of the sculpture done at North American Aviation Plant at Downey where I learned some about "fusion welding" and some other highly advanced technology that one does not carry away from the Art Institute, but which becomes useful when working on those sorts of things. This is the concrete pouring job which was interesting and complicated. Again, I think I am learning from every one of those works. There is a terrific feedback, and that is where the satisfactions come in. Actually, in some ways at some times, you have the illusion that the sculpture pushes its way through the earth. I was in the same way very impressed with Easter Island characters standing there with grass up to their chests, sort of wading in the earth as if they were wading in the water.

This is an old thing of mine from 1959. I picked up an old stone in Israel and chiseled the inner part straight forward, considering it an architectural piece, like an auditorium into which you can go and listen to music. Anyway, I thought the door should not stop at man's height, but should go all the way up to the end of the building. That sort of thing I was pre-occupied with when I did this one.

This is the sculpture in Long Beach, 1965, and how one sees it when in the trench looking upward. From some views, there are sharp and unexpected angles. It is kind of a discovery, a surprise element of black concrete, seven-sack mix, three quarter aggregate. I made the ground work there for the sake of the sculpture. In fact, this is a dialogue between the two; one is very conscious of his feet when walking around it. Now, this type of sculpture carries us into the next sculpture and the next thing and the next thing. That is what I should like to be surprised by in my own work. When I did this, it occurred to me that there is a language between the earth and the sculpture, and here it is a ramp, above ground.

At Fanshawe College, London, Ontario, we did a take-off at the end of the ramp, anchoring fifteen cubic yards of concrete. In fact, it started out as a demonstration to the students of the problem with size and scale to people. What is monumental? People are size; people are scale. I did it with the students there. It is called *Now.* It is plywood over an iron frame with concrete poured inside. The piece is supposed to be a temporary structure for this was the only way we could get the City Parks Department to approve it. If it were to be permanent, it would have taken a year to get a permit. Now, they are very proud of it and do not want it moved. It belongs and is cared for.

That is all!

Thank you, and bye for now.

SLIDE PRESENTATION

Clement Meadmore
New York

I am showing work done since 1968, all of which is based on two modular elements which I have worked out. They are a little hard to describe, although they are perfectly simple, geometrically.

Though we are having a symposium about monumental sculpture, I have never made a decision to be a monumental sculptor. The pieces just seen were made as very small maquettes and seemed to need to be larger than they were. When I figured out how large they should be, it turned out to be the scale which serves an outdoor use.

These two pieces were photographed in the fields around the Lippencott Works in New Haven, where they were built. Most of the pieces you will be seeing were built there, except for a couple of concrete pieces which were rather experimental. The one in the background is now in the Chicago Art Institute. It is in Cor-Ten steel, which, after a year or so of weathering, has turned almost black, a sort of blackish-brown color.

These modules are cast in polyester. They have about a two-inch cross section. One is a 45 degree piece. In other words, the square cross section is sitting at 45 degrees of the axis of rotation. It goes through a semi-circle in this case. They both are actually quarter-circle modules put together; thus each one of these consists of two quarter-circle modules.

The piece on the right has a square of 22½ degree angle again rotated through a half a circle. These are all cast in synthetic rubber molds. You will see that a 22½ degree one, when placed on a table, gives you 45 degrees at the other end, which relates it to the 45 degree module.

Now, this shows two pieces being put together, the beginning of making a sculpture. In other words, I just play with these like children's blocks, virtually gluing them together and breaking them apart until I get something I want. It is a completely geometric form. Hopefully, when they are put together, they result in something which feels a little less geometric, and which happens rarely. There are probably fifty or one hundred pieces semi-completed and then destroyed before one of them satisfies me in this sense. As you can see, the final result is one of the small maquettes. It is about eight inches long and has a fairly organic feel to it. Hopefully, it has gone beyond the geometric feeling of the basic module that it is made from.

This is just another angle of the same piece, showing the full-size modules which have a four-foot cross section. They are being delivered to Columbia University for a piece which was erected there in 1968.

The little trap door in the bottom eventually will be against the ground. It enables whoever gets inside to bolt the piece together and get out again. The trap door is only about fifteen inches square; the Lippencott men who build these pieces are much more than fifteen inches, but seem to extrude themselves in and out of these trap doors quite well.

This was the second largest piece I had built. It is Cor-Ten steel and painted black. The reason for the painting is that in New York City, one has to paint sculptures, as Mr. Rosenthal will explain later on, because of the graffiti problem. I'd like to have it left in Cor-Ten and left to rust, but once Cor-Ten gets graffitied, there is almost nothing you can do except paint it, so we decided just to paint it to begin with; it is painted every year or so. It was rather interesting. This piece was put up soon after the protests at Columbia, during the Viet-

nam War, and I thought all the "hip" students would appreciate the piece. When I was helping to assemble it, and they did not know me from among the other workers, I heard them make remarks which were incredibly Philistine. And there were letters written to the college newspaper objecting to the piece, and saying that it was an elitist piece of capitalist expenditure, and so on.

However, about a month later, someone wrote a eulogy, a little poem in the newspaper, to the piece; apparently, it has become very well accepted.

This is a piece done in Mexico City for the Olympic Games. It was built in concrete with Mexican labor. That was the stipulation for all the pieces built for the Games. It was built on a steel frame; the concrete was sprayed on and hand troweled. It stands about ten feet off the highway on a small cliff face of natural volcanic rock which extends along the highway and looks very good at this point. Its black geometry had a marvelous sort of contrast with the brownish-gray volcanic rock. Later on, the Mexican Government wished to improve matters by building a little stone retaining wall against the rock to cover up the nasty natural rock, and they put a nice, big sign alongside it saying what the piece means.

This is a view from behind the piece, looking out over the highway and over a series of little hovels that are occupied by people who came in from the countryside to "make it" in Mexico City and didn't. We felt a bit strange about building these pieces which would actually have been more luxurious, if they could have been lived in, than the hovels across the street. They were pieces that one could enter, and this has actually happened; one of the pieces is now inhabited—a family of ten living in it. That was not my piece, for mine did not have a doorway in it. Recently, I heard that the government has made a further improvement to the piece; they painted it bright blue! I spoke to Helen Escobedo of Mexico City about it yesterday. She said that her piece had been painted "bathroom" green, and there is nothing she can do about it. She does not hold out much hope for my piece.

The piece on the left is the first large one I had done. It is a very simple piece which was bought by a Mrs. Bradley in Milwaukee, who has an incredible collection in her garden with an artificial lake. It is a strange collection. It has very good pieces by very good sculptors, but they are all vertical pieces. She is allergic to horizontal sculpture. It was a problem for me, because I rarely do vertical pieces. She bought this first one, which happened to be vertical, and said she wanted to buy a mate for it. It took me years to get around to doing another vertical one. She snapped it up when it was finally done. Now she has two pieces, one of which is still in the early weathering stages. They are both about twenty feet high. Actually, they look very good in this natural setting. Placing sculpture, especially geometric sculptures in urban settings, is a more difficult problem.

This is one example of that. This is a piece in front of an insurance building in Australia. It was commissioned as a limited competition among three sculptors, and they sent me many drawings. This is a little story about architects. They sent me an incredible stack of drawings, plans, elevations, plumbing diagrams, perspectives, and wiring diagrams. Everything! You could have built the building from it. Apparently I was supposed to study all of this very seriously and figure out a sculpture to go with the building. If I had done that, it would have been an appalling sculpture. Looking instead at a series of models I was working on at the time, I visualized each one with this building. I decided on one to send them. The architects would take back the prize money, if they knew. I won the competition, as you can see, and I asked the architects in what way the other two sculptors did not satisfy their demands. They responded. "Well, they sort of played games with the building." This, of course, was exactly what the architects had asked for.

I made no attempt to make the sculpture go with the building in any way at all, because my philosophy is that a sculpture is supposed to inhabit the space, rather than create the space the way the building does. It is much more like a person in the space than a building in the space, or a link between people and buildings. So the sculpture sits there and feels as though it is comfortable there, but could just as well walk away and be somewhere else. I tend to disagree with some of the things Irving Sandler said along the lines of integrating sculpture and buildings. I think, as an inhabitant, a sculpture integrated with a building would be like a woman wearing a dress with a fabric to match the wallpaper of the room she was in.

Applause.

I appreciate the applause, by the way. It is better than laughter, because my point was not meant to be funny.

This piece has a six-foot square cross section, which means that it acts like an arch. You can walk underneath it; it is almost an environmental piece in that sense. Another point about this is that the building on the left is a wrap-around L-shape, and the building on the right is a tower, so you have a low "L" wrapped around a tall tower, forming an L-shaped space in which the sculpture sits. The site of this sculpture is more like that which would be chosen for a city planning situation, rather than by architects typically feeling a one-to-one relationship between building and sculpture where the sculpture is placed in front of the building like a cultural badge of honor. It is my belief that a sculpture's site should be designated by city planners rather than by architects. In other words, it should not be a matter of a sculpture belonging to a building. The sculpture should belong to the environment as a whole. The problem here is that you must either have the city pay for the sculpture, or a building owner generous enough to give the sculpture to the city rather than the usual one-to-one relationship of building and sculpture. And again, it is my belief that sculpture should be sited by city planners, rather than by architects. So much for philosophy.

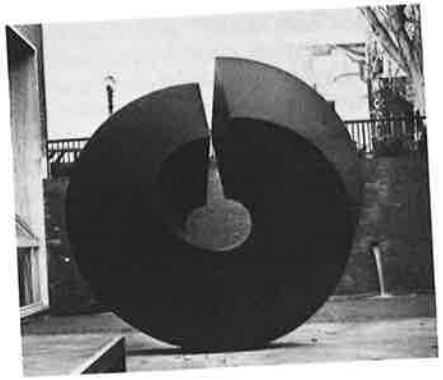
This piece is probably the largest one I have done. It is about forty-five feet long, now located beside the National Art Museum in Canberra, Australia.

This is a small version of a larger piece which actually consists of a cube, a quarter-circle segment and another quarter-circle segment opposed to the first one, and then another cube. It is a simple form, in terms of the elements, but it is a fairly complex visual sensation.

This is the full-sized version which belongs to Nelson Rockefeller, and was displayed in the Museum of Modern Art when his collection was shown there.

This piece, now on the West Coast, was shown in Boston at the Civic Center. One can see a slightly polished band along the middle where the children would run to the top and slide off the end. I do not claim this as any virtue for the sculpture—I am not making monkey bars and such things—it just happens that the children did this, which explains the strange patina.

Another piece is installed in the Albany Mall Project, another Rockefeller-connected affair. It is about thirty-five feet long, and sixteen feet high. The cross section is six feet, which I now feel is a little much, because even though it is at the lowest level, you can not look across the opening. It is like being confronted with a wall. I have decided since to restrict size to something slightly smaller than that. This, too, is painted, and clients did not like the idea of the Cor-Ten steel. As you can see, the pigeons perch across the top quite frequently, and they do not just sit there, either!



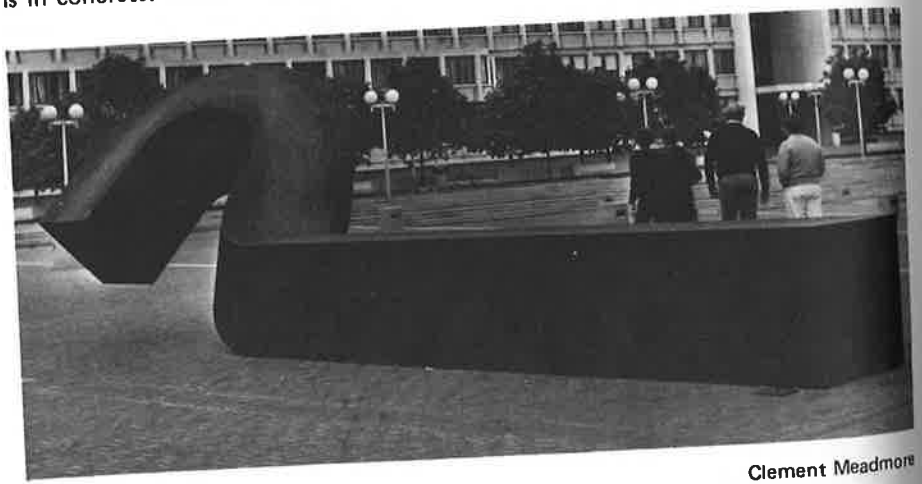
Clement Meadmore

This next piece is the most geometric one in feeling. There are two semi-circles, again, with that 22½ degree angle. They are connected at the bottom, opposed to each other in a way, meeting at a point at the top. It required many calculations to do it accurately. This sculpture is also located on the West Coast.

Like the Mexican piece, this one is in concrete. It was constructed for a concrete symposium in Vermont where eleven of us participated. It was formed by the ferro-concrete technique (which means there is a thin shell of concrete on a multi-layered reinforcing mesh). The sculpture was first placed on a highway site in Vermont, but now it rests just off Riverside Drive in New York at a three-way intersection. It gets covered regularly with graffiti. In the beginning, the local residents would paint out the graffiti every week, but they are getting tired and so it doesn't look this good now. The residents, however, were most enthusiastic during the first year or so to maintain the sculpture.

This last piece is in New Orleans now, at the river-end of Canal Street. It is probably the most complex one that I have done. If any of you are down there, you might have an interesting experience with this piece, if you are willing to be slightly acrobatic. You may climb right into the internal core and experience it as an environmental piece.

I guess that's it.



Clement Meadmore

STEEL SCULPTURE

SLIDE PRESENTATION

Tony Rosenthal
New York

From an early age, I have always been involved with public sculpture. My first commission was for the New York City World's Fair in 1939. Yesterday, I listened to some of the questions from the floor, one of which was, "How do you get commissions like that?" and especially in my case; as I was only 24 at that time. The answer to that is: the architect who chose me was my counselor at camp!

When we renewed our acquaintance after many years, I did have work in the studio to show him. May I have the first slide please?

This is probably one of the best known works that I have done, a cube in Astor Place. We have heard much about Don Lipponcott and Bruce Gitlin at Milgo. It was Don who, when first starting out in about 1965 or 1966, called me from the Whitney Museum. He had just seen a piece of mine in the annual exhibition, a tall bronze piece I had made in my studio. He asked if I would be interested in making it 30 feet high. Actually, I felt that, for this sculpture, 11 feet was high enough, and at that particular time, I was making small versions of a cube and had gotten as far as a seven-foot version in bronze. I was quite anxious to do it larger. It was timely for me that Don did call, because this was a marvelous thing for me, and later, for all sculptors who have worked with Don and others, to realize our works in large size, not commissioned or financed by someone else. In this case, Don and I made this piece in partnership. Since we were making it on speculation and did not know exactly where it was going, we did have a problem of size. Don very wisely came to the conclusion that it should not be over eight feet on a side, for that is the width of a flat-bed truck.

Fortunately, right after it was finished, there was an exhibition in New York City, the Sculpture in Environment Show, where pieces were placed in all boroughs and in all major areas. This cube was placed on an island in Astor Place. I was disappointed at first, for I had hoped that someone would say to put it at Lincoln Center or the Seagram Building. It was fortunate that it was placed in Astor Place as the other positions would have been temporary ones. A nice thing happened. Cooper Union students, faculty, and the Ukrainian Society, which is on Second Avenue, wrote letters and called the Park Department to say, "We've decided we would like to see the piece remain." Since it was up to me to find a donor, I talked to my gallery, which was the Knoedler; they said they would take care of it. But then Thanksgiving came, which was the deadline, and nobody had done anything. We did find, however, a marvelous person who paid Don for his construction, and I gave my share of it to the City, so that I could realize a hope of having something permanently in New York.

Incidentally, remarks have been made about the care of the piece. This monument belongs to the City of New York, and as such, is to be taken care of by the Monuments Division of the Park Department. But there are only six persons in the Monuments Division of the Park Department. There are six hundred monuments, and as you know, graffiti is a problem. When the piece first went up in Astor Place (which joins St. Mark's Place), that was the center of all the Vietnam protests. So this piece became a sort of bulletin board, and we could never pass it without seeing it completely covered with posters.

There was a time when it almost became completely obliterated, and I rather liked it; it had a whole new texture. One night after we went by, I got pretty upset and called the Park

Department and said, "You've got to start taking care of it." They said they would. About two months later, they went to Astor Place, which, by that time, was a mess! On the day they cleaned it, somebody that afternoon had placed another poster saying, "Jim, I'm going to meet you across the street," I finally decided that I could not let it go on like this. I went the following Sunday morning, parked right alongside it, did a little scraping and started painting. Various people in the area, students and the like, came by and said, 'What are you doing? We like the posters!" I told them, "I'm the sculptor, and I'd like to see it black." And they said, "All right, we'll help you." So they all joined in and we had it done in a couple of hours. One of the people, a war veteran, said that he would really like the responsibility of doing something, did not want much money, and could he take care of it? That was about six years ago, and it is still going on. I raised his pay from $25 a month to $35, because of inflation.

Getting back to the size of the piece, Clem Meadmore and I were on a panel one night at the Arts Club, when someone in the audience said, "It's too small. It should have been built much larger," and so on. This comment has been made before by other speakers. I like the personal size of the piece.

In this slide you can see the kids who are actually turning the piece. They are able to manipulate it. If it were larger, it would be too imposing and forbidding. I also like very much the personal contact that the people can have with it.

Another piece that was made soon after *Alamo*, was a sculpture that is now situated in New York on 58th Street between Park and Lexington, in front of an office building. It is shown on the truck coming down from Lippencott. We had its arrival beautifully timed. The sculpture was supposed to arrive at nine in the morning, and the publicity people for the building had told all the television, radio and newspaper reporters to be there, which they were. We had an enormous crane and a crew of six, all there to unload. Nine o'clock, 9:30, 10:00, 10:30. We called; the truck was broken down halfway into the city. I thought, "Oh, God, I've lost this great opportunity for publicity," etc. But as it happened, it was a very bad news day. The owner of the building got a coffee cart, and everybody was standing there waiting. Great climax: the sculpture came in on a big flatbed—great applause! We had it going up much higher than it had to because of the great possibility for photos.

And there is the piece, installed. Originally, it was installed where it was blocking the windows of a store, and they could not rent the store, Fortunately, I had always wanted the piece moved to Fifty-eighth, so they used that as a reason to do so. Since it is no longer in front of the store, the store is rented.

This piece turns, so it is sort of fun, because whenever you drive by, you can see it in a different position. At that time most of my pieces were cubes, disks, columns and triangular pieces.

I am keeping this slide of the box before you because the shipping business is a problem. This piece was made by Milgo in Brooklyn. Though Don made the first one, he did not want to tackle the second one because, I think, he had had enough problems. The people in Honolulu had seen the polished disk in New York and had asked my gallery if I would make another one, which I did. When the piece was finished and we were ready to ship, the ships were changed from regular freighters into container ships, and suddenly we found they would not take the sculpture since it was over eight feet. We finally had to go to Senator Inouye, who is from Hawaii and heads the Maritime Commission. He put the pressure on, and they put it on the deck of a boat; that is how it arrived! This piece, incidentally, was very beautifully made.

The polishing of this version was fantastic. Actually, thank God, I no longer do any polishing! It is incredibly difficult, and it doesn't work out well because the reflection of the metal destroys the form. The reflection of anything around becomes an important part of the piece, and that is not always the greatest.

SUN DISK T. Rosenthal

Soon after that, I did an ark for a Jewish temple in Birmingham, Michigan. Yamasaki was the architect, for whom I have the greatest respect. He is really a wonderful person. It was a marvelous experience for me, because Yamasaki's office was constantly sending someone to see if I was coming along O.K., and how he could help. There were a lot of technical things involved in this work. Inside the ark where the Torahs were, there had to be lights, and the eight-foot sliding doors had to be installed in such a way that when they were opened, the entire ark didn't start swaying, and so on. There were great problems. The ark was made outside, hanging from the crane, because it was too tall for indoor working space. It rained that entire summer. So it wasn't easy. Inside the temple, the 70 foot-high screen behind the ark was also part of my project. I thought it would be fun to show you what one must go through, sometimes, for installation, especially inside of a building. The steel at the top, 76 feet high, was necessary to pull this ark into place.

Odyssey, also built by Don, was in a show that was under the direction of Andrew Richey and was shipped over to Middelheim Museum in Antwerp. The Middelheim purchased the piece, and it has remained in the Middelheim Sculpture Garden.

This is in an edition of three. Each of those disks is six feet in diameter. It is not an enormous piece, but is one that was difficult to make. This one of the edition was photographed at Newport Beach in the Monument Show by Margaret Robinette, who, incidentally, has a new book that just came out. I saw it a few minutes ago at the book exhibit here. It is quite good. This piece is now installed at Yale. The third one is at San Diego at the Fine Arts Museum.

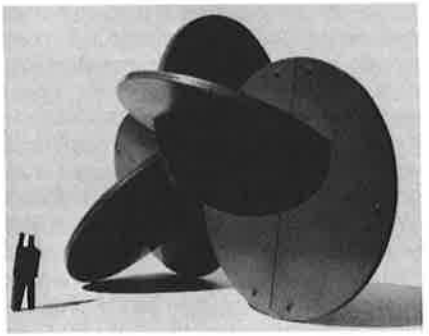
This Cor-Ten "turning-piece" was put together two summers ago in Oregon at an international symposium organized by Jan Zach, who is also on the Conference Committee here. I have always been involved in turning-pieces. In this case five panels are supported by a post with hinges, and the panels move. It was something of a transition piece between some of the earlier ones and the ones that I am doing now.

The fellow on top is Jim Schmidt, who was working on the piece. These are all young sculptors who came from all over the West to work on the project. I actually deserted them in the middle. I just gave them the plans and left, because, at that time, I was installing a sculpture at the Police building in downtown New York, and that was more than I could handle. So when I came back to Oregon it was all ready to go, and we put it up. They knew more about it than I did! Jim asked me if he could come to New York and work for me. But I said, "Forget it. I do not want the responsibility," as I already had a young painter who had been working for me for four or five years. Also, I did not need that much help. Just a year ago last April, he called, saying that he was in New York, and I said, "Well, come on over

for lunch, and I'll show you what we're doing." He has been with me ever since.

I thought that I was going to go very deeply into hinge pieces, which were helpful in originating their own design. I thought I could "cop-out" a little bit that way, but during that time, I started making the sculpture in the Civic Center of New York, and I got so involved that I just had to forget everything else for about a year.

I started this piece in 1971; this picture was taken in 1973, and during that time, I did very little else. Some of you may be interested in how such a commission is achieved. This architect was not my counselor at camp. The architects for the city asked an art agent, Annie Damaz, to arrange for a committee to go to four or five different sculptors in the city, and over a period of time, to make various visits to the artists' studios, see what they were doing, talk with them and try to get an idea of what he would do. This went on and on for about a year, and I was the one who was chosen. At the time, the responsibility of making such a large sculpture didn't exactly overwhelm me because I was anxious to do it. But I did feel that, yes, it was a pretty good load. In fact, I kept making the same model over and over again, until, when I had six or seven in the studio, I finally realized that I wasn't making any changes. So I finally said, "O.K., that's it." When we finally were able to get it going,



5 IN 1 Maquette T. Rosenthal

Bruce Gitlin of Milgo took on the job, and he gave the making of the discs to a factory in the Bronx, a very sophisticated tank factory. It was really quite interesting to watch them form the discs and roll the ten-inch channels on the edge. These discs are each 20 feet

FABRICATION OF DISKS

in diameter, ten inches thick. The day the truck came was a pretty exciting one for me! Before I change the slide, notice that the discs were brought in on the side of the truck. That is because they were too tall to come through the city, under bridges, under wiring, and so on, so the idea was to drop the discs down as close as possible to the street, and at an angle which could also minimize the height. We also had to worry about the eight-foot width limitation. Each of these trips took three or four hours, and there were five discs. This shows them putting the discs down, and I have this slide because you can see the bracket on the truck, which cost me $3,500; I am not sure why!

The discs, sadly, were left there, piled on top of one another for three or four months, while the city and I went through a great dispute on who was responsible for the installation. My contract read that I was supposed to bring a completed sculpture to the site. The sculpture is 42 feet long, 32 feet high, 28 feet wide, and weighed 75,000 lbs. I had a lot of wise-acres saying, "Oh, why don't you get a helicopter and drop it right in there?" But you know and I know that they are not allowed in the city. And then the next one, since it is right next to the Brooklyn Bridge: "Put it on a barge," but then what do you do? You still have to bring it up. It is impossible to do.

One-half of the area of each was covered. The other half of the exposed tubes were left open, so that they could be joined to the next disc. But, in the meantime, I had long discussions with the Department of Public Works, who are not easy people with which to deal. I was investigated by the Comptrollers Department. It was awful! I think that for about six months I didn't sleep; I was drinking too much; I didn't do any work at all. Then finally one day they said, "All right. Let's put the damned thing up. It's in the way," and the delay was just about finished. While the last photo (delivery of the discs) was in October of 1973, actual installation began in January of 1974.

UNDER CONSTRUCTION

There is a huge crane which we can not see. It goes up about eight, ten stories. We figured out the "where and how" these discs should be placed. It was very well engineered. The engineers, incidentally, were one of the reasons it was held up so long. Bruce and I had figured out that one good-sized beam in the center, plus the channel on the rim, certainly would take care of it when all five discs were interlocked. But the engineers added about 40,000 pounds of interior structure. That not only cost me a mint, but it also made everything very complicated. Bruce and I stood around here for quite a few days figuring out the angles, and then finally, I went off a little distance and said, "All right, put it down a little more or slant it to the left." It wasn't easy!

Remember, each of these disks is 20 feet in diameter. The foundation is enormous. This is over one of the oldest sections of New York, and underneath all this, is "spaghetti" of all kinds of conduits, dating back to the 18th century, and it all had to be bridged. So the engineers designed an enormous concrete bridge from which leg bolts came up to secure the steel-base plates which the contractor then was supposed to put in and to which we were to weld the tubes. The day came when we were going to start installing. The contractor dug up the brick paving because it had been closed over, and no steel plates were there. The crane and everybody were waiting around. So overnight, Bruce got these plates, put them in the next morning, and off we went! These little complications provided opportunities for some fantastic photos. On about the third or the fourth day, the weather was 12 degrees above zero and we couldn't get the welder going, so the morning was wasted. In the afternoon it finally got going. With the last of the disks we thought, "Boy, now all we have to do is put on the rest of the sheets!" But not so, because the contractor who was to do all of the work finally came to the conclusion that he was going to lose money, and he pulled his men off. He left just two men and some ladders. These guys worked from January until summer. You can see that the trees are in bloom—this is in July— and there they are, putting on the last of the rim which was two five-inch channels. This is all in Mayari steel, which is Bethlehem's version of Cor-Ten steel. And you see the mess that went on in that plaza. The City couldn't stand us any more!

One of the problems with Cor-Ten

steel is that it takes a little time for it to become uniform. As a result, the comments we got about the rusted old steel were not exactly pleasantly received.

This is a photo I took about two months ago in the cold weather, but at least it starts to show the piece all in one color. I am bringing you back to this slide to show you the square tubing which was used instead of I beams. Each of the tubes had to be a different size in order to insure a different strength. Tubing is always the same on the outside; the strength or the thickness is on the inside. This tubing became a very important thing for me. I got to the point that I wished we didn't have to put the skin on, because we had some very beautiful things happening. So, after I finally got free of all the jobs that I was doing, and was able to get going, I bought a shell of a lot of tubing. This is one of the first pieces on the terrace of Knoedlers. I am doing quite a few of these now. This also is one of the new pieces which was just acquired by the Chrysler Museum in Norfolk.

These are models of pieces which I have in mind to make using this tubing. I love the freedom of the shapes, and the fact that the shapes are all predetermined, or existing. I am now making all these pieces in my own studio with Jim, for , as much as I love Bruce and Don, I find it is a lot cheaper to do it myself, and I make changes as I go.

This is a project which I have enlarged in my studio to ten feet high. It was noticed by an architect visiting my studio recently, and we are now talking hopefully about making it around seventy feet high. It would be of tubing about forty-eight inches square. But, with none of the problems that I had at the Police Building, this could be put up in about a week, I think.

HAMMERSKJOLD T. Rosenthal

These are some of the other pieces—the new works in the tubes that I have in my studio with Jim. This last one is a horizontal piece that I finished about a week ago. It is called, *OKAY.*

Thank you.

SLIDE PRESENTATION

Dimitri Hadzi
Massachusetts

I now know what it is to be a batboy! Before going on, I should like to dedicate my talk to the students and the young sculptors in this auditorium. This would be a great honor for me. (Applause.)

There are many of you young people here. For most of the slide presentations, the sculptors have shown their work at mid or late-career, but no one has shown, it seems to me, what he or she had done as a young sculptor, and how he arrived at where he is today. So I thought I would start with some of my very early pieces. (Applause.)

Thank you. The inspiration for these pieces came when I was on a Fulbright in Greece. At that time it was very costly for me to cast even these small pieces; they are actually only six inches high, so I really loved them, and I still do. I am not ashamed of my early work. As you can see, the Centaur and Lapith motif was inspired by classical, Hellenistic, and baroque sculpture. On the right is a small 6-inch sculpture of *Leda and the Swan.* The *Bird Woman* on the left is only about eight inches high. I was very excited at the time I did this sculpture! And on the right is a Greek dance group. It is interesting that later on, when I submitted for the *Nebraska Highway Sculpture Competition,* I came right back to this basic form, quite subconsciously.

A big departure in my career came about with the *Auschwitz Competition.* I know we have had many conversations about monuments, but I was very moved by the competition. I submitted these two models. The one on the right would have been probably forty feet high. It is quite baroque, with a heavy Bernini influence, along with Zadkine and others, but still there is a Hadzi "touch" to it. On the left is a 40-foot relief through which one could have walked.

Because of my experience in the *Auschwitz Competition,* I became re-interested in World War II, in which I participated. I studied the history and became involved in the helmet and shield motifs. The shield sculpture on the right, a six-foot high bronze is in various collections including the Bunshaft, Albright-Knox in Buffalo. The helmet sculpture on the left is in the Guggenheim and Hirshhorn Museums. It is approximately six feet, six inches high, a size which I consider quite monumental.

One of my first commissions was inspired by a Mozart Quartet, "The Hunt," and was done for the Lincoln Center. The maquette is on the right, approximately eleven inches high, and the finished model is on the left, approximately eleven feet high. It is designed so that one can walk through it.

THERMOPYLAE Dimitri Hadzi

This sculpture, called *Thermopylae,* was commissioned by Walter Gropius and the United States Government; it was my first heroic piece. I was interested in yesterday's talk about heroes and monuments.

Kennedy was a hero; I think that today we need some heroes. I remember the time, as do many of us, when during the Kennedy Presidency, there was a certain electricity and excitement all over the world, a feeling which we lack now.

This bronze is 16 feet high, cast in 16 pieces, and the appendages were put on with Roman joints. It is designed to walk under and for looking up into various apertures. It was inspired by *Profiles in Courage.* Courage being its theme, the piece shows strength of man, particularly that of Kennedy. It has been in the Boston City Hall Plaza approximately eight years now, and it has never been scratched. It was there during many demonstrations, and though people have climbed on it, it was not damaged, and the G.S.A. in Washington, D.C. said that no one has ever written a letter of protest about it.

This piece always reminds me of a funny incident. When I finished it and was waxing it, and I stepped back to look at it, I noticed an Irishman looking at it, scratching his head, wondering what it was. An old girl friend of his walked down and said, "Say Harry, when did you feed it last?" Harry turned around and replied, "Well, I don't know which end to feed!" We are always exposed to this kind of thing with the public, but we don't mind, at least I don't.

This gives you some idea of the scale. The work took me three years to complete. The original study was 16 inches high; then I took it up to one-half scale, which is 8 feet, and we worked that model approximately six months. Enlarging it to the full 16 feet, I took a full year to rework that model, making optical corrections and changes of feeling. Naturally, I worked on every square inch of that piece.

These are some more recent pieces, the *Pillars of Hercules,* and *Basilous* (The King), which are getting more slabular in feeling. I was flattered and touched when my assistant, who I hope is in the audience, purchased one of these from me. (If she is here, I want to talk to her; she owes me $25.00!)

The piece on the right is called *Samurai.* I have noticed in works of recent years, including one of the Chase Manhatten pieces, that a certain oriental calligraphic quality has been creeping into my work. They are also slabular. The bronze piece on the right is approximately three and one-half feet. Hopefully, someday I will do it in a larger scale. The maquette and drawings are owned by the Fogg Museum at Harvard University. This led to a commission for the Federal Office Building in Minneapolis, with Gunnar Birkerts, the architect. He commissioned three sculptors to do pieces for his extremely monumental and powerful building. I decided to do something totemic called *Arcturus,* after one of my favorite stars. I usually work up in stages, and this is a nine-foot version, which is at Fullerton College, California. There it is, in front of the building. I thought the best thing was not to try to compete with the building, but to get away from it, as far as possible. There are many surprises when you work with architects. When I was commissioned to do the piece, those big broad bands which protect the trees and also serve as seats, were not designed. They are so monumental that they distract and take away from the sculpture. The sculpture was also designed to be hidden among the trees of the plaza, an inclined plane, which serves as an introduction to the building. It is 25 feet high, and it took approximately eighteen months to do.

Now this is a three-foot Roman travertine model for a 25-foot version for the Commercial Union Building in Boston. Everything was going well until the recession came and the project was terminated. As you can see, this is also the new slab technique using two big forms on top with a light passage coming through. I still hope to do it sometime. I must say, it is extremely disappointing not to do this commission, because I think I would have enjoyed it more than almost any piece I have done.

At this point I am also becoming very interested in stone. Isamu Noguchi has been at me for years, saying, "Dimitri, you're a Greek; you should be carving. You have a natural heredity, why don't you get out there and carve?" I am finally taking his advice.

Then there was Jan Zach's Oregon *International Sculpture Symposium,* in which six of us were invited to work on various projects. I was disappointed that four other sculptors could not come because of financial reasons, including Goeritz, whom I was very anxious to meet. I am glad that I finally met him here, just a few hours ago. This Oregon symposium was particularly interesting to me since I was, and still am, a "bronze" man. I have worked twenty or twenty-five years in bronze as a studio artist. When I received this opportunity, one well-paid, we were to have a crew from the workshop to help. I thought this would be a marvelous occasion to say, "Hell, I'll do anything now that I've been frustrated; I'll work in stone; I won't start any sketches; I'll create the creative process at the quarry; I'll work in public and I'll work with a lot of people." It was quite a terrifying experience, especially since only two of my helpers had experience with the local stone, a volcanic stone, basalt. It was a difficult time. We spent some two or three weeks breaking tools and learning how to handle equipment. We were almost the laughing stock of the conference until things started shaping up. But I had some very faithgul helpers, some who worked as long as 16 hours a day. We worked at night, weekends; no one really knew, including myself, how the final concept would turn out. It became known as Hadzi's "Stonehenge." I spent my nights alone, living with the various rocks that were deposited on the site, trying to experience their feeling, hoping that they would talk to me.

These are various shots of the pieces. This was just a temporary

OREGON SYMPOSIUM Dimitri Hadzi

site upon which we worked, as you can see, out in the open. A lot of curious people came around, and when it was time to polish stones, they came in awfully handy. When they got close, we would hand them a rubbing brick and a bucket of water and say, "Try your hand at it." And it worked very well. We got a lot of free labor that way!

The biggest stone was 20 tons, and took a whole month to flatten to a plane and polish. Almost everyone took part, but the final three weeks' work was done by only two of the workers.

This project was started also by several people and was finally finished by Jerry Waggoner, who is to help me on a project in Portland, if G.S.A. ever approves the model. When the project was finished, we decided to have a celebration. My Greek friends cooked a Greek dinner outside. We were blessed with a full moon. The party started at sunset and went all through the night until sunrise. There was something mystic about dancing around and through all these columns. There are various finishes; some surfaces were left quite rough, some highly finished, others partly finished. I was interested in creating sun reflectors. It was interesting to see the reflective qualities and the shadows

as the sun moved around the sky. In the evening it was very dramatic and mysterious.

There was one block which I knew was going to separate if it was bounced around. So I decided to split it, open it up, and use it as a portal, so one could walk through it into the composition.

I have just completed the doors for the American Church in Rome, St. Pauls, a commission which I worked on for 12 years to commemorate the Ecumenical Meeting of Pope John XXIII with Bishop Fisher of Canterbury. It was one of the most difficult commissions I have ever worked on. The maquettes are on the right-hand side, and are approximately twelve inches high, and the plasters on the left are in my studio in Rome, and are 12 feet high. They are now cast in bronze. One side portrays the instability and breakup of the Church, and on the other side is the Door of Hope.

This was the only competition I ever won, but the Governor of Nebraska decided not to put state money in so two of us were dropped out, though I was one of the original 12 winners of the Nebraska Highway Sculpture Competition. I worked with a young landscape architect, Ace Torre, who is a New Orleans architect. We spent quite a bit of time redesigning the site, and when I went to Nebraska to talk to the Highway Commission people, they said that it would be absolutely impossible to change the site. They really gave me a hard time!

In a way, I guess I was relieved to be out of it, although it would have been very exciting to do the sculpture, which was to be at Chapel, not in the flat part of Nebraska. It is quite hilly and mysterious there, and I think I would have really enjoyed doing the piece, which would have been in stone.

Excuse the little Roman warrior; it is a small maquette for the *Nebraska Competition.*

Thank you.

MONUMENTAL SCULPTURE—REALITY: LEGAL, ECONOMIC, TECHNOLOGICAL

Donald Thalacker, Moderator
Franklin Feldman — Irving Sandler
Bruce Gitlin — Bernard Frazier
Kosso Eloul — Duayne Hatchett

GEOFFREY PLATT:
Presently, Donald Thalacker is the director of the General Services Administration Fine Arts Program, which initiates the policy of the incorpoation of major art works into federal buildings. I wonder if I could suggest, Don, a way for you to begin the program this afternoon: please tell everyone how it all works and how the artist can get involved in this program which, because of its size, I suppose, is surrounded in a kind of gossamer veil of mystery.

DONALD THALACKER:
Thank you, Jeff. Artists are selected by the General Services Administration as a result of a four-step process. The process begins with the architect for each federal building. The General Services Administration is not really in the business of simply buying art, but rather,trying to integrate works of art into the architectural design. So the architect is encouraged, when developing his design concept, to think about using works of art to make his over-all design work. After we receive his proposal, we request the National Endowment of the Arts to appoint a panel of art professionals, local, regional, and national, to meet with the project architect at the project site for the purpose of nominating artists. At that meeting I bring slides of artists who have requested consideration, either specifically for a given project, or generally. In addition, the panelists bring slides and other visual material of artists who they think would be right on target for the propsed commission, and the architect does the same. It is noramlly a day-long session, viewing the works of hundreds of artists, and from this, three to five artists are nominated. These nominations are transmitted to the General Services Administration where they are reviewed by G.S.A.'s Fine Arts Design Review Panel, which makes recommendations to the administrator, and he is empowered to make the selection. After the artist has been selected, I negotiate a fixed-price contact with him. I will show you the results in a quick run-through of slides. Regrettably, they all are not here, but I hope that it will help to dispel a charge that Isamu Noguchi leveled yesterday and then retracted, and that is that G.S.A. is not developing an official style of art. (Slide Presentation).

This is a work, or will become a work before your eyes, by Calder. It is his *Flamingo*, located in Chicago and dedicated in October, 1974. At the dedication ceremony Calder came into town on top of an antique circus wagon drawn by horses. And there he is with his wife, and Senator Percy. It was a real sight!

This project is four murals by Jack Beal, representing the role of the American worker in the 17th, 18th, 19th, and 20th centuries. It is to be installed at the Labor Building in Washington, D. C.

This is a maquette by Tony Smith for the same building. It will be 24 feet high by 30 feet long.

Peter Voulkos, for Honolulu.

A work by Frank Stella in Wilmington, Delaware.

Bruce Beasley, for San Diego.

Louise Nevelson, recently installed, entitled *Bicentennial Dawn*, in Philadelphia. Emily Genauer, of the New York Post, said, for her money, "It's the most beautiful work of art in America." Ninety feet long.

This is William Goodman's work

in Las Cruces, New Mexico. A storm of protest. Isamu Noguchi's landscape of *Time,* in Seattle. A storm of protest.

Milton Glazer's mural, wrapping around a building in Indianapolis. Thirty-five swashes of color, each about twenty feet high, bleeding into each other. I am told that cars crash as they drift from lane to lane looking at the brilliant colors.

Maquette by Charles Ross, of prisms suspended and filled with mineral oil, casting rainbow hues throughout the lobby.

George Segal is developing a work for Buffalo.

Charles Searles, a mural for Philadelphia.

Duayne Hatchett, Rochester. A storm of protest.

David von Schlegle doing a fountain sculpture for Philadelphia, using water as a design element, in a pool 54 feet in diameter.

Lin Emery, a maquette for a federal building in Homa.

Beverly Pepper's work for San Diego.

A maquette for a work by John Retta for Roanoke.

A maquette, Rudy Heinze, for Winston Salem, North Carolina.

George Rickey, for Honolulu.

Al Held, two 91-foot long murals for Philadelphia.

Robert Maki, Eugene, Oregon. Thank you.

I should like to introduce our panelists today. The subject of the Round Table is "Monumental Sculpture—Reality: Legal, Economic and Technological. I am going to ask the panelists to bring to your attention the significant problems as each one sees them from his own point of view. On the far right, Irving Sandler, art critic and historian. Duayne Hatchett, sculptor. Bernard Frazier, sculptor. Franklin Feldman, lawyer, co-author of *Art Works, Law, Policy, Practice.* Bruce Gitlin, fabricator and president of Milgrow Art Systems, and Kosso Eloul, sculptor. Perhaps we could start with you, Eloul.

KOSSO ELOUL:

What are the problems? I think the first problem is just being a sculptor. But, I have noticed one thing. In the face of all the professions in the world, I have never heard of a sculptor who changed professions. So the problem is not all that bad. They all stay sculptors. Personally, my problem is the sculptures on my shelf. Not those that I have done, it is those I haven't done. I was thinking about this business that was mentioned a while ago by Hilton Kramer, about sculpture pollution. Looking at the large number of sculptors in the audience, and thinking about the amount of work the sculptor can do, it occurred to me that when I go to a bookstore or a library today, there are a large number of books. And thank God that there are! It makes us choose. We have choices. Think of a worse situation: What if there were no choices? I sincerely hope that practically everybody who has a good idea, boils it down and gives it a form, can present it to the public and have the storms you were talking about. Those storms are healthy. The worst thing is when a sculptor has an exhibit and it is so quiet that it passes unnoticed. Or, when he does a work and nobody sees it. Nobody wants to work in a vacuum, or, in a theraputic sense, as if he does it for himself and that's it. Sculpture is not occupational therapy. Sculpture, as far as I understand it, is a language. You want to catch something—an idea, a thought, a feeling—give it a shape and a form, pass it to the public, and then stand by the site and anonymously listen to see if you come across or not. Europe has had several hundred years of doing sculpture. It is interesting to note what was in the air that the age or the time wanted to capture, even if it was a general on a horse. Europe is full of generals on horses; nobody wants to put a general in bronze on a horse, now! What are we doing? In some ways, when we talk about the whole thing, look at clippings and slides one after the other, fast, we find out, really, the shape or the face or the smell or the taste or the meaning of our own living time, which is the greatest thing that can happen: being awake to our time. Sometimes, when I go to the bookstore and pick up an art book to decide if it makes sense to me, I do not go through it page by page, I flip it like a harmonica: all in one shot. It does not give me the precise information about the book, but it gives me the spirit of it. I have no time to dwell on every one of the pages. What Don Thalacker has shown us is a face of our times. That is what we are concerned with. And I think that we are just at the beginning of it. I think that the problem is: What does society want from us; What does it ask for? In order to understand this, I look at the medical profession. We know what society wants from its doctors. They know how to organize themselves, to look after two things. One is a vehicle by which they can discharge what society wants from them. And the second one is to protect themselves and their interests in order to be able to discharge what society wants them to discharge. The Medical Association is a closely defined and regulated body, as is the architectural profession . . . the Bar Association. If you give the decisionmaking, the power over budgets, to any one of those professions to the doctors, for example, you know what will happen. Give it all to a specific profession. If given to the sculptors, you will have sculptures instead of buildings. Give it to the architects, and you will have buildings with no sculpture. Give it to art consultants, and sometimes you will have a consultant, but you will have no art, because half of the budget is eaten up by the art consultant. To speak generously, and with no bad spirit, I say that there is a certain, healthy way of looking after our best interests, a very realistic way. Our interests overlap with the law, with the fabricator, with the art consultant, with the museum director, with the art critic, and with the public in general. We have to protect our interests if we want to discharge what society wants us to do: give shape or face to the age we are in. For instance, when I watched with great fascination, this shot to the moon, this walk on the moon, I said to myself, very romantically, "What an age! What an age, I'm so happy to be alive.!" I got drunk. Then, the following morning I said, "Well, where do I go from here?" Then I realized that it was too big for me to comprehend. The gibberish that they were talking about meant nothing to me. It was some sort of technical lingo between one component of the capsule to the other, and one of them was a human being. But there was a great thing there: Our sense of gravity—I have been working with gravity, with relationships that dealt with balance and gravity—all of a sudden it just blew my mind. It's still there, somewhere; I am trying to catch it. How do you translate it into everyday terms, give it a shape and a form, so that if you put it in a public square, people will pass by and understand what that trip to the moon meant? It is very simple if once we catch it and manage to give it a language which is universal. Maybe that is why most of us are working in geometrical shapes and forms. But, this is what I believe is in the air. Even if nobody defined it, if no one called upon it and there was no manifesto, no challenge; and even if everybody works according to his own likes, very privately, very individually, it is still in the air. It is being etched from us time and again. I think that our big problem is not making the sculpture. If I have a problem, I throw it at Bruce and I say, "We have a problem." If a thing might topple, what do I do? We go to engineers. If I have a law problem, we settle down on some contract. My problem is people. Society, and the fact that society has not defined for its sculptors what it has defined for its lawyers, architects, engineers, military

guys, and everybody else.

THALACKER:

Thank you, Kosso. Bruce, after Kosso throws you his problems, what do you do with them? What do you think the significant problems are?

BRUCE GITLIN:

Well, there are a lot of significant problems. This panel is relevant to me, because I feel that I have a majority of the problems. After the sculptor has solved the whole situation aesthetically, the hard problems that I am concerned with become apparent. The first problem is trying to give a price to the sculptor for the fabrication of his work. It is a very difficult thing. Sometimes it is a guess, and sometimes it is really trying to figure out something. The larger the piece is, the more difficult the problem, because in many cases, you have to work up the estimates before any engineering is done. Engineering can cost a lot of money. You can lose or you can make what you estimated. An artist will come with a commission, and I will have to propose a price to him in order to work up his estimate for the people asking him to do the work. In order for a fabricator to come up with a price for fabricating or manufacturing it much of the time you have to have information that cannot be determined until the final engineering has been done. The problem is that engineering costs money! There is a great deal of time involved, since many drawings have to be done as well as many calculations. Nobody wants to spend the money for the estimates. From your best knowledge and past experience, you have to go ahead and pick a price for the fabrication. Sometimes you do this, and the artist gets the project. Then some nice city official asks you to go ahead and submit certified engineering drawings. Since we do not do that, we contract out to professional engineers to get the drawings. Because they are engineers, and do not relate to sculpture—most of them don't like sculpture—we end up having a very big problem. Most sculpture is difficult to design from an engineering standpoint. There are tremendous problems with cantilevering and flat surfaces in wind loads, as well as numerous problems that have not necessarily been tackled before by an ordinary engineer. What they will go ahead and do then, is over-design, throw in lots of structural supports and things that are not necessary to accomplish your work. This will cost somebody a lot of money. Sometimes it costs me, because I made a bad estimate. Sometimes it costs the artist even though he realizes the problem. It is a very big problem. I think we heard Tony Rosenthal say that 40,000 pounds of interior structure was added to his piece at the Police Building in New York City, and it is true. The engineers added all these extra tubes and structures because they did not know what was going to happen to the sculpture. Well, after they were convinced that they really needed 40,000 pounds, Tony and I called the, talked to them and kept chiseling away, until really, we wound up with only about 15,000 pounds extra. Now, we did not redesign the piece, we just kept asking them to take off some of the weight, to make it less expensive. They kept doing it, because they knew they had tremendous factors of safety built into the piece, but they would not let us know this at the beginning. It took a number of months to get very many extra supports pulled out of the piece.

Once you get past the problem of pricing, and settle on what the piece is actually going to cost, the next problem is the legal one, setting up a contract or an arrangement with the artist as to what you are going to do for him, and what he is going to do for you, and what he expects from you, and what you expect from him. Most artists do not like to get involved with formal contracts. Personally, I do not like to get involved with very formal contracts either, because then one gets involved with lawyers, who make a lot of money on making big formal contracts. Sorry. What we usually end up doing with artists that we work with continually, is to decide verbally what we are going to do. With others we write letters of agreement. Some even have formal contracts that are put out by cities and governments and corporations that are trying to protect themselves for various reasons. Once we have a contract, the next problem is trying to collect the money from whoever is paying for the piece. This is an enormous problem. Most artists cannot finance their own large-scale sculptures, because there are a lot of dollars involved. Most people who pay for the sculpture do not like to put the money up front, because they are afraid they are not going to get the work. You have to set up arrangements whereby the people pay part of the money ahead of time, and part of it while the process of fabrication is going on; hopefully you will collect it all when the piece is installed, but not necessarily.

Once the process has started, the technical problems enter. How do you actually do the sculpture? There are very few sculptures that have the same problems. I have done much sculpture work, probably about 3,000 major pieces now, and almost every piece that comes in, has different problems. Bob Grosvenor does huge cantilevers, and Roger Bollomy has done huge fountains. Rosenthal has done these big disks that cantilever and hang out in space with tremendous forces involved. There are water sculptures; there are air sculptures; there are different kinds of problems, and they all have to be handled individually. Techniques have to be set up; sometimes you have to learn them. A lot of research goes into pieces, problems in materials, finishes—I could go for days about some of the real technical problems. Technical concerns are a major interest of artists, and if anybody would like to talk about this, later, we could get together, privately.

Once the technical problems have been worked over and basically solved, the real fabrication starts, and here again there are some problems. Many artists like to be involved in their work. In a factory, where you have numerous hardworking skilled craftsmen, there is sometimes a great deal of friction between a free-wheeling artist and a straight craftsman. There is a tremendous problem of communication, dialogue and vocabulary. However, after many years of aggravation and trouble, we have been able to work through much of that. But still, every artist has his own vocabulary with which he tries to describe what he wants you to do, and this has to be communicated to the people who are doing the work. This is why there are few places in the country that are actually doing large-scale sculpture on a continuous basis. It is a very difficult process.

Once the piece has been executed, and comes out all right, the next problem is usually getting it to the site. There are tremendous problems with handling, with transporation and installation. These are all different all individual, and deal with what kind of sculpture you have and where it is going. These also can be solved, and I think the last problem, again, goes back to economics: hoping to collect the money that you are supposed to get for doing what you set out to do. I have tried to give a quick run-down of major problems. Doing sculpture is really problem solving. The whole thing is a problem from the start, and one reason I think artists do come to fabricators is that they would rather give some of the ulcers to somebody else! It is really hard. Not only because of the size and the scale, but the problems are very obvious. The problem with the difficulty of managing to create a large piece of work, is enormous, and we try to go ahead and share some of their problems with them.

THALACKER:

Thank you, Bruce. Franklin, is it really true that lawyers are out to make as much money as they can off of the

artists?
FRANKLIN FELDMAN:
Off everybody, if you want the truth.
THALACKER:
There's nothing like honesty, eh?
FELDMAN:
I want to provide some hard-core information and some soft-core information from my position as a lawyer, who has dealt, from time to time, with certain of these problems. First, in terms of soft-core information, I think what I am about to say is true of artists, as well as non-artists. Do not trust the spoken word. I think every understanding that you have, whether it be with a fabricator, someone like Bruce Gitlin—he is not going to be around forever; one day he will give it up or choose only some of you with whom he is going to deal—you are going to have to deal with other fabricators, to have some written agreement. You need not have a lawyer for a written agreement. It is a misconception to think you do. In fact, I would suspect that most laymen can put down in writing precisely what they would like to provide. They know the guts of the agreement. The best of lawyers cannot write an agreement that both of the parties have not made. There are many things that an agreement can cover, should cover. What is the responsibility of the fabricator? How many hours is he required to put in? Is he required to see the work through to completion? When is payment to be made? Who is responsible in case there is any damage to an individual or to another's property? As you probably know, there have been situations where persons have been injured, indeed, killed. Everybody gets sued. There is one gospel that every lawyer knows: you never decide to sue A, and not B, and not C; you sue everybody, everyone you can find. And you hope that the jury will pick out among the group, solvent defendents who are liable. That is basically the underlying theory of law. You can, however, and most people don't recognize this, provide inter sese among yourselves where the responsibility is supposed to lie. That is, if I were an artist and I were dealing with Bruce, I would say, "Bruce, I want you to indemnify me in the event that this structure falls and destroys a life or property." He would say, "No, that's not my responsibility." But one way or another we are having to decide on the bottom line. Either it is going to be his responsibility, or mine. Now he may say, "I'll be responsible, provided the engineering drawings are correct." You may have to go to the engineers and say, "We want you to guarantee that these drawings are correct. You will supervise. We don't want you to just give us the drawings. We want to be sure that they are followed." I cannot tell you how much grief can be saved by having some kind of a written arrangement.

The time of payment is critical. As an artist, you may find that the fabricator—I know that you do not do this, Bruce, but there will be other fabricators who come into this picture—may decide to write to the person paying the bill, asking that payment be made directly to him. There should be a clear understanding of where the dollars are. My point on the soft-core information is, try to reflect this in writing. Even if you never have to go to the writing, the whole history of who is the President of the United States is basically a question of the written document. If there had been no tapes, I dare say who would be the President of the United States today. It's the same thing. Memories fade and recollection gets distorted with the best of people.

In terms of some hard-core informaton, I know that most artists, not only sculptors alone, have been concerned about one aspect of the law dealing with taxes, that they think is unfair to them. This is the question of contributions to a charitable organization, of whether or not they can deduct the value of the property, rather than simply the cost of their materials. As you probably already know, the law today states that only the cost of materials is deductible as an ordinary income tax deduction. Without getting into a dispute as to whether or not that is fair, I believe that it is a fair rule, because it is a consistent rule that is applied to every professional and non-professional, in that the value of one's services can never be deducted. If a physician goes to a hospital and gives a hundred hours, he cannot take any deduction. Now you may say that the artist is different, but I feel there is a more serious problem which the artist has, that most of the sculptors here probably are not taking into account; you are young and you probably have not reached that degree of success where it becomes a big problem. But I have seen the problem arise where artists are not so young, and are much more successful than they realize—the problem in terms of the estate tax. The David Smith case touched only one aspect of the problem. As you probably know, the law with respect to the estate taxes—and estate tax is a federal matter, so regardless of what state in which you are domiciled, you still must pay estate taxes— states that all property which you have, must be valued at the date of death. Now that is relatively easy to do with respect to cash, amounts in savings accounts, and stocks and bonds, but when you come to your own work, here the law, I think, has really short-changed the artist, in my judgment. Here the law provides—David Smith is just another example—that you must value all of the artist's work at the date of death. All of the unsold work which he owned at the then market value. Now, what is the "then market value"? The law is—and this is again consistent with other aspects—that it is what the artist would obtain, rather than what he would receive, or retain. That is to say,if his selling price is $10,000 per piece, and I am using a large number just for the purposes of example, the fact that his dealer might have received 50 percent, then you must value, for estate purposes, that piece of property at $10,000. Even though, if in fact on the date of the death, the dealer walked up and said, "I have a customer for each one of you 425 pieces," the number that David Smith left on the day of his death, and he would only get 10,000 times 425 minus 50 percent, or minus $5,000, the government says, "Sorry, we'll tax the total of the $10,000 in terms of the evaluation." Estate tax rates are quite high. If you get into high enough numbers, they are about as high, for all practical purposes, as the income taxes. To me this is grossly unfair. It is unfair, because these are not the dollars that the artist would receive. And now, for the first time, the government is saying in a turnabout, while you cannot get the deduction, for the values you have created in terms of the estate tax, we are going to tax you at those values. The problem is that you cannot pay your estate taxes with your sculpture. In fact, there was a taxpayer years ago, with some property—it was not art pieces—to whom the government said, "We are valuing all these pieces of property at A, B, C, D, and E." But you have to pay cash for your estate taxes. He said, "Fine. You think they are worth A, B, C, D, and E, and you want the tax at a certain rate? Here, take A, B, C, D, and E at the rates that you are ascribing to them." The court said no. The government is required to recieve only cash. American cash. You cannot give even Italian lira, or any other form of money. You see the problem. Now, the problem is what in the world do you do about all of this? And someone would say, "Well, you don't create any works that would survive your death." While great in theory, it is probably not going to work in practice. In anticipation of the problem, some artists, some collectors that I know, have started giving away their work. Now, if you give away your work to a spouse or even to a good friend, and

you can document this, there is no problem documenting that, this would not be part of the artist's estate. It is true, that if you gave everything to your spouse, and you were unfortunate enough to have your spouse survive you, this would be part of the spouse's estate. Probably, in the over-all run of things, life has sufficient toleration for that kind of a risk, I would think. The problem can be a serious one for the family. Now, what can be done? First, give it away. Some people have done that. Second, bequeath the work to a particular person. A spouse, a child, but provide for this person to be able to renounce the bequest in favor of a charity, such as a museum. Why am I suggesting it that way? Because, if you simply gave the work to your spouse, and the spouse, realizing how high the taxes are, decides to give it away, that is not going to help you. In order to get the deduction, the gift must come from the decedent, i.e., from the person who is being taxed. In other words, if the estate is being taxed, then the property to the museum must come from the decedent. Once you give it to the spouse, it is not coming from the decedent any more. But if you provide that I am giving it to my wife, Jane, or to my husband, Tom, but he or she may renounce in favor of a charity, presumably it will never go to Jane or Tom. He renounces the gift. You can renounce one's gift. And this should work. Of course, there is a corresponding real-life problem. Will the museum accept the work? You can give it to museums, you can give it to cities, you can give it to any tax-deductible entity, and presumably, the surviving spouse probably can select the entity. The bottom line is that it will not hurt you, and it may save you a tremendous amount of taxes, because you will never have the proceeds anyway. You will never get the valuation the government claims. And you have to pay the taxes!

Another problem . . . a real-life problem. When you bequeath property in a will, most people do not recognize that that property is bequeathed as is, where is. So, if one were to give a piece of sculpture which is on loan to a museum in Topeka, Kansas, and you give that work to Aunt Nellie, Aunt Nellie must pick up that work in Topeka, Kansas. The estate is not permitted to pay for the transportation to Aunt Nellie, and if Aunt Nellie does not have the dollars to pay for that work, it is her problem. The beneficiaries of the estate can legitimately object to the payment of any freight costs from Topeka, Kansas, or from Italy, wherever the work happens to be located, and most people are probably not thinking that way. Now, how would you handle that? You could provide in your will that "I give the work, and the costs of transportation" from wherever the work may be located. You do not have to have specific statements. If a person writes a will on day "one," and puts that instrument away, hoping never to look at it again, I would say that in 80, 90 percent of the cases, it is never looked at again. Twenty-five years later that person may die with that instrument, and that instrument has no relevance. But it is the one under which you have to operate. There are certain wealthy people, and certain wealthy artists who periodically update their will, but it doesn't happen very often. If people finally get around to having a will, which they should do at one point in their lives, they really do not go back to it. It gives them all kinds of heebie-jeebies; they are very concerned about looking at that kind of instrument, although, we have found in our own office that one way to insure a long life is to continue to revise your will. Apparently, every time you revise your will, you have another five years, and another five years. The people who live the longest, in our office, are those who revise their wills the most.

Now, in terms of the insurance: Not all work by artists is insured. I am not suggesting that all work should be insu insured. But again, if you bequeath work, and if the artist did have insurance on the work, that insurance does not go with the work, per se. So if you give a piece which is insured—it could be in your home; it could be work that was completed some time ago—and you transfer this work to a realtive, to a spouse, then that insurance terminates. The short-rate premium, which most insurances companies will refund for the unexpired term, belongs to the estate. It does not belong to the legatee. That could be important, with substantial insurance, because, for one thing, you want to be sure that work is always insured. One way to handle this is to provide, and again, it is very brief, "I give all of the work to A, B, or to C, or to whomever I give it under my will; I also give a pro-rata interest in the insurance policy covering it." This will provide for continued coverage of the work and avoid the short-rate deduction. To issue a new policy, the insurance company will not charge you for a full-rate premium and then return to the estate a portion of the premium on a short-rate basis.

There are two other problems that I think probably are worth talking about. One, sticking to estate problems, deals with the obligation of a family to complete the work of an artist who has died. Probably no one thinks about that, but very often work is incomplete when someone dies. Does the family have an obligation to complete that work: Well, first, as a general proposition, it depends on what the contract says. To go back to my bit of soft-core information, one should have that covered in a contract, because the family may have an obligation not to complete the visual, the aesthetic part of the work. If there is certain mechanical work to get done, sand blasting, or certain mechanical things, you will have to do it out of your pocket. We are talking about dollars and cents. We are not asking for the artist's vision any more; the work has been done, but A hasn't been paid, B hasn't been paid, certain grinding and polishing hasn't been done, and the artist never expected to do it himself. It may be that the family is obligated to complete that portion of the contract dealing with the ministerial aspects, the financial aspects . . . which could run into many dollars. One could handle that in an agreement, or one could say in an inter-agreement that upon the artist's death, the family would be released from any further monetary obligations, for the unfinished part of the work. Of course, there is a second problem, if the work is only partially completed: What is the obligation of the family vis-a-vis the person who has contracted for the work, to find a substitute artist and charge any excess costs to the family? I have seen this happen, where the artist. because he wanted to enhance his reputation, has contracted for a work at $10,000 dollars; the work is not complete, and you want to have it completed, and someone else says it is going to cost $8,000 dollars to complete the piece, but the artist was already paid a large portion of those dollars and it has been spent. Cover it, if you can, by a written agreement.

One other problem. I hope you all face this one, someday: the problem of reproduction. The Chicago-Picasso case is the key case. There was a movie here the other day on the Chicago-Picasso. In brief, coming back to the key issues, the problem is, who has the right to reproduce and make copies of a work of art? It is basically no different than any other issue in copyright law. The law in the United States is, in order to have a so-called statuary right of copyright, which is the right provided by the statute, you must put a simple letter "c" in a circle, or the word "copyright," and your name and a date on an accessible portion of the work. In my opinion, it requires the sculptors to have no problem at all. In the Chicago-Picasso case, the city of Chicago induced Picasso to do a maquette for the city. Picasso did so, and he was not concerned about

copyrights. The city was so delighted to have it, they started to have press conferences, and they began issuing all kinds of photographs of the work in their enthusiasm, they neglected to put a copyright notice on all of these press releases. They were just copies of the maquette. Subsequently, the work was built. And in the final installation, there was a "c" in a circle, nd the right gibberish. A company that wanted to reproduce post cards, was concerned that if it reproduced post cards, it might be sued by the City of Chicago. It brought a declatory judgment action, which means an action where they are saying to the court, "Please let us know if we're doing wrong," in the federal court in Chicago, and argued that the work had been published without the copyright notice. You cannot publish a work, and publish basically means to disseminate a number of copies in a free way. There is no restriction on copying. They said that they had done that. And the City of Chicago said, "No, we didn't. We put it on the final piece." And the court said, "The final piece is not important. You must do it all along." Therefore, the city lost the right to maintain the reproduction rights. Now I can understand a lot of artists saying, "I hope everybody reproduces my work." Maybe so, but there may come a time when you would feel otherwise.

We were involved many years ago with a famous graphic artist, who lost thousands upon thousands of dollars because his most famous graphic, I do not want to say his name; you would know who it is, forgot to put the "c" in a circle. That print has been reproduced on every plate, on every piece of secondary merchandise. Now it may be that if he had put the "c" in the circle, they would have copied something else. There are enough things in the public domain; you do not have to worry about a piece of sculpture. Or a piece of art, if you copy that piece. But that is not the way it always runs. A small "c" on the base. It is so simple to do, and I would strongly recommend it, with respect to sculptures.

I have of late been involved with the family of Melvina Hoffman. Many of you surely know her name, for she was a woman sculptor who died about ten years ago. She would probably not get a commission, I suspect, from Don Thalacker, today, because of her menner of work, but she was an outstanding woman, an outstanding sculptress. She was doing her thing before Women's Liberation became stylish. But if you look at her work, and this is going back 50 or 60 years, she has that "c" in a circle, so it is not something that is coming into style now. She was well advised by others, and she knew what she was doing. It is going to be very hard for anyone to make small copies, large copies, any kind of copies of her work and I highly recommend the use of the copyright notice.

THALACKER:
Bernard? Do you have your copyright ready?

BERNARD FRAZIER:
You know, I have never thought of it, so I thank Franklin Feldman, and I will put a "c" in a circle from now on. With such factual and such precise information having just come to me, I am a little embarrassed.

Turning to another kind of concern, there are indeed many problems, but I should like to say that I am very optimistic, at lease, about the slow, but certain, solving of these problems. The very fact that this Conference, now in its ninth version, has attracted so many people, all concerned and all working towards the solving of the problems, means we are going someplace. We are going someplace, and I happen to think that we will get there!

Now my few words, here, will be rather disconnected. I have several thoughts, and I will state them, I hope, rather briefly. I am quite happy to notice that maybe we are beginning to emerge from what I shall call a slightly overbearing technical age. It is entirely logical, that some 30 or 40 years ago, when many new materials were put at our fingertips, we began experimentation with all of them. We were concerned with how to put them together, how to make art of them. I am very happy and very optimistic with the idea that the technical side, though still there, and still wonderfully handled by many people, by Don Gitlin and sculptors in the crowd, that perhaps we are going to again begin to merge the aesthetic values with the technical processes. I do not want them divided. I want them simply to be merged together so that they are one and the same. I feel strongly, and I have talked about it for some time, that our sculpture schools should begin the inclusion of a professional procedures course, as part of the teaching of sculpture. Professional procedures, as demonstrated here in two recent cases, are something that should come into the sculptor's mind at a very early time. Other professions have this. They give their young people, or allow them, the opportunity to begin to assimilate professional procedures early, so that they can come into the field, come onto the scene, and get up on the battleline at an earlier time than most novice sculptors have. We have had to beat our way up, find our way up, wander up and stumble into it. I think we can do something about this. That is a problem and, I think, a solution. Another problem that we have, which is solving itself, is the diversity of our ideology. We are, of course, the first real generation that seems to know all about the world, and even a good deal about outside the world. This has led to a diverse approach to aesthetics and to technology, too. It is solving itself, but I beg us all to push on its solving, promote the idea that we are all one world, (pardon the trite expression), but in addition, we are all one spirit. I am hoping that our Conference, in a year or so, shall bring more definitely into the situation the contribution of our own aboriginal people, our predecessors on this continent, and what they have to contribute to us. We seem to have felt that we are contributing to them by bringing to them our European-invasion culture. Let us see it go the other way a little bit. Let us see what they have which we need, and I say that we need it very, very greatly.

The emerging unity of this Conference I want to speak about again. It is definitely demonstrating progress. I happen to have been brought in, and I shall be boastful here to say, on the inception of these Conferences by Elden Tefft. We wondered, in the beginning, if sculptors would like to know each other. We had rather definite indications, I think, that perhaps they would not. None of us wants to do what the other sculptor has done. But here we have proven conclusively that, though we may disagree quite seriously in the exact approach, that we are one outfit, we have one purpose, and this is a step towards a true professionalism. It is a step toward the point when we can operate as a more forceful group towards unification. Through the bringing in of our colleagues, the legal angle, the fabrication angle, and all of those that you have heard in the other Round Table. We are drawing towards a point where we have greater power and greater opportunities and greater right to support each other. Where we do not have to enter a situation where one member of our profession is happy to tear the other one down a little bit. I am glad that we are getting together.

Now, perhaps the most important thing that I want to say, though the most difficult because I really do not have the words for it, is that with all that we have seen, these wonderful and superb slides and demonstrations of technical grandeur and magnificance, I hope, I pray, that we do not forget that our primary purpose is one of social ideology or of social significance. I do not want to say that we do not have it. I am just afraid that we

are not conscious enough that we do have it. I should like to point out that if you go to Persepolis, or up the Nile Valley, you do see things that required great technical effort and great performance, but they were, in all cases, towards something, and I beg us not to forget that for one moment.

I wish to use as an illustration something that I am sure will bring a little ripple of laughter from you. There is a possibility that the Statue of Liberty is the most important statue in America. She would not win second prize at a County Fair, undoubtedly, but the point is that she means something. She has been important, terribly important to a lot of people. And she will be. This is what I mean; we must not forget this. I should like to see, of course, a whole new round of sculptures of liberty in present terms, holding to the intense ideology and purpose of the Statue of Liberty. I will end my remarks here by saying that I am illustrating this. At this time, I am working on a statue of justice. Can you imagine anything more trite, or more uninspiring perhaps, than to redo *Justice*? But it just happens that all of my life I have been a little dubious about *Justice*, blind-folded, with a sword in her hand, wearing a nighty perhpas like from Montgomery Ward's catalogue. It has rubbed me the wrong way. Finally, after all these generations, I now have the chance to take a stab at it, and so I am literally reversing the idea. I am making *Justice* not from the concept of what I think might have originated in the castle on the hillside, where justice was decided by somebody in the chamber, and the word would come down to us peasants in the valley that we would go along with it or have our heads chopped off? Instead, this time with the support of the state, we are going to have a *Justice* with all vision instead of no She is to hold a falcon, which has eight-times the eye power of the human eye, and which flies high above the small things of the earth and eats no carrion, which I think is an important part of justice. I use that as an example of what I mean. Let us not lose sight of the idea that we as sculptors, through thousands of years, have carried the ball. We have invented, I am sure we have, many of the ideals and many of the ways of carrying concepts of social betterment, social uplift, and social excellence to the people. We have been the principal and often the eternal spokesmen; I think that our little outfit here should carry on with that, and I think we can!

THALACKER:

Thank you, Bernard.

We have another sculptor to hear from, who recently completed a G.S.A. Commission. Duayne, what has been your experience with large-scale public sculpture?

DUAYNE HATCHETT:

If I had known what I should have known in the beginning, I may never have done my first large-scale sculpture.

However, the thrill of being able to do something to be seen in the context of people, was exciting enough for me to tackle it. Gradually, as one goes along picking up more and more information, hopefully you become qualified enough to get out of some of the problems that are being generated. It would be nice, of course, to come in with a full package in the beginning. I first became interested in large works because I ran around with architects at school, and for the first 10 years after school, during my early teaching positions, the people I related to the most were young architects. However, it was not until around the middle of the 1950s, possibly 1957 or 1956, that when asked to do something I was willing to approach it. I had some experiences that were good at that time, and some that were not so good. By 1963, I decided that it was all too complex. I began to see the problems that we are talking about today, and I copped out. When one becomes involved with the kinds of definitions I am, it is called bridge work, and not art. And that involves the bridge work

unions. The complexities resulting within my attitude at that time were more than I wanted to deal with. I not only could not, but I did not feel honest in doing it. However, my relationship and association with the architect was not bad at all, at that time. It seemed to be a very healthy one, but the relationship with all the other technical problems behind it, that have been defined here as "soft-ware," were the ones that really confused me. This recent piece is the first commission that I have done since 1963. I must admit that the fact that the government had such a tight contact was somewhat supporting. The fact that I had a number of years of experience in my own attitudes about what I thought the work should be was some support. But in the kind of problems that I have had to deal with in the last piece and in another one coming up, I think I can relate for you just briefly what you might be able to do, if you want to keep out of the context that Bruce is dealing with. Incidentally, it certainly is a lot of help if you can have someone else take all the responsibility. I want it all to go on into the work, and therefore, I like to cut in very few people. If I can build it myself, that is the way I want to do it, since I have learned those skills.

I found there are rules governing people whom you hire. You have to have insurance which is number one in importance. Since I have been in teaching, I have had good people come to me, fortunately. By using two or three assistants at a time, you can keep the yearly wages below the minimum until that point at which they are trained, and then you can sub-contract the work to them. This protects you from some of the taxes that the state wishes to level on you. I find that sub-contracting is particularly useful in the realm of installation, and therefore I have chosen not to become involved with that end of it. On one occasion when I did, I found I was very naive, but fortunately nothing happened of consequence to get me into trouble.

I was showing on the second floor of a building in New York, a gallery on 71st Street. The piece was so big that it would not go into the building unless we took the window sections out. Of course, we were not suppose to be involved in dismantling architecture, but we pulled these seven pieces up with block and tackle, from five stories above. The crowd watching below included a policeman, who fortunately did not know the rules at the time or we could have gotten into grouble! But there are complications on that end that I do not want anything to do with at all. Other than installation, I like to control every bit of the sculpture myself, if possible. Probably my ideas subconsciously involve that as a design attitude. I don't know. I do not really think, however, that because I wish total control, that I would design for that purpose.

At any rate, to this point everything that I have done, I have been able to do in my own studio with my assistants, whom I could not have done without. Each time I have done a piece I have learned something new, and for this reason everything that Bruce said touched me personally. Last time, I had to learn machining. Until to that time, I had never been in a machine shop except to order parts. All these problems can be solved with the right instruction and the right equipment. That has been my approach. I have tried to keep it simple with as few people involved as possible. Trying to control as much as I can, myself, in a way that is part of the kick I get out of it.

Much has been said at this Conference about monumentality. In watching colleagues through the years and trying to analyze my own attitudes, aside from the fact that size is not in the long run what makes an idea big, I decided after Saarinen's

Gateway to the West, we have no problem defining what is big. That is as big as we are all going to get. About the only thing I would like to do, in relation to size, is just not worry about size, and keep the context as closely related to people and the area it is to be seen in as possible. If I can keep that under control, then size is beside the point.

THALACKER:

I think it is fitting that we wrap up with Irving Sandler, the art critic, and then we will open up the floor for questions.

IRVING SANDLER:

You are not about to wrap up with me, Don. I think what I liked about this session, and it is a terrific session, is that it is practical. Most of the speakers have spoken about really practical problems that artists who want to work in the public arena face. You know what to watch out for and how to deal with problems. Would you then deal with the problem of "the storm of protest." In other words, what do artists face in dealing with the public? It seems to me that there are three agencies. There is the artist; there is what you could call the community, however, you want to define that, the art-conscious community or the larger community, and then there is the government. On the basis of your experience, what tips can you give about dealing with "a storm of protest."

THALACKER:

I think the tables have been turned here! As you know, Irving, it is a very serious problem, because realistically speaking, I think that for most people in a community, it is the viewing experience that is the educator, and I do not think that there is any real substitute for it. It is important, in so far as you can, or one can, to prepare the community to build up support, a growing enthusiasm for a coming work. But that also has problems. We have now decided to do this at the very beginning, when we are nominating artists, for example, inviting local people who are knowledgeable in the arts. We cannot close these meetings. They are not closed-door meetings, and they shouldn't be. You want to be very careful in doing this, in trying to build community support, that you don't find yourselves putting up as they say, a work of art by a committee or getting to the lowest common denominator. Another dangerous possibility is, and this related directly to the government officials and the strength of their backbones, if the protest begins early, at a point perhaps before an artist is put under contract, and the protest is severe and strong, the question in my mind is whether or not we will be able to stand up under the pressure and proceed with that contract. It would be easier to drop it, probably like a hot potato. The one thing that I keep saying, and it is frequently misinterpreted, is, if you give a work of art time to grow on the people around it, they will become very fond of it. Irving, you talked earlier about the Grand Rapids experience. We have found the same thing to be true in just about every piece that we have put up. Our piece by Frank Stella in Wilmington, has letters with 40 signatures on them. About three months afterwards, a man-on-the-street television interviewer talked to some of the people who had been against it originally, and lo and behold, they said that they liked it! They thought that it brightened up the lobby, that it was more attractive than the clock or the picture of the President, which had been there before. It was all very encouraging. Does that somehow answer your question?

SANDLER:

Yes, enough, to begin with.

THALACKER:

Then I think we can flip on all the lights, and we should like to have questions from the floor.

UNIDENTIFIED AUDIENCE:

I have a question for Mr. Feldman. What is the responsibility of the sculptor after the large-scale sculpture has been accepted by the owner?

FELDMAN:

Are you speaking in the absence of a written agreement covering the point?

AUDIENCE:

I didn't qualify it. In a meeting recently, it was brought out to sculptors that there could be problems if, after a piece of sculpture was accepted, it proved defective.

FELDMAN:

Well, there are various aspects to your question, as I understand it. For example, part A, as I see it, is what would be the obligation of the artist to continually upgrade the work? That is to say, let's assume the patina turned a color that the owner did not like. Can he call upon the artist and say, "Make it the way that it was?" I think the short answer would be no. I am talking in the absence of a written agreement. I think that the basic rule would be, that once the artist has sold the work, the person has bought it basically as is, where is. There is no doctrine of merchantability that the work will lose interest. If the work should collapse and was originally constructed in a way that was negligently made, because of the fault of the artist, I think the artist's responsibility would still continue, subject, of course, to the statute of limitations. There is always a statute of limitations, perhaps three years. But if the work should fall apart, someone is going to be responsible within that statutory period: maybe the fabricator, and maybe the artist. I am certain that both would be sued. But that is not the way the question usually comes up in context. I thought you were going to ask me the reverse of that question, that is to say, what rights does the artist have, after the sale of the work?

Three days ago, there was a story in the *New York Times* about two sculptors who brought a suit against the Whitney Museum for the return of their work. Paul Andera and Robert Morris I do not know if either of them is here. They claim that the way the work is displayed by the Whitney is not to their liking. The Whitney has said, for publication, that they will fight this law suit "to the death." They feel they own the work, that they acquired the work by sale, and that the artists have no residual rights to tell them what to do with the work. They could take that work and throw it in the Hudson River! Now, if the artists had reserved the right to approve the installation, to require that the work be displayed at least once every 12 months, two things would have happend! One, they either would have had the agreement, or two, they would have had their sculpture. The museum never would have bought the work. I suspect it would have been the latter. Go on.

UNIDENTIFIED AUDIENCE:

I'm talking more about physical damage. If a person, let's say a young person, climbs up on the sculpture and falls and hurts himself, does the sculptor retain any responsibility?

FELDMAN:

There is a concept in the law known as the "attractive nuisance." If someone creates a nuisance that attracts people, you must have the foresight to see the consequences of that attraction. Therefore, if you put out this attraction, for example, in a playground, and you know that it is going to attract children to this entity, and you know that they are going to climb on it, then you must be sure that the work is safe. Now you are throwing in another layer, that he sold the work, and that now the work is owned by another institution. If that other institution could prevent the damage, in other words, would put signs up saying, "No playing on the top," "No playing from five to six,"; "No playing without a lifeguard around," and so forth, they may have the independent, and perhaps paramount, responsibility.

ELOUL:

Franklin, there is a little answer to that. At the University of California at Long Beach, they simply turn to the city. The city has some kind of insurance on playgrounds and what

happens when a kid plays on it, and he falls, and the parents sue the city? So the city is insured. If the buyer of the property, the owner of the sculpture is covered, you are covered. If not, make sure that he is insured, so that you are. That is the only way that I can think of.

FELDMAN:

Can I dissent from that? The short answer, as you say, is basically yes. However, in insurance, there is something known as subrogation. We are going to have more of a legal discussion here than an art discussion. There is a concept in insurance known as subrogation. That is to say, if the insurance company pays out, and any insurance company in that situation would pay out, it in turn is subrogated, that is, it stands in the shoes of the person primarily responsible. If in those facts, the artist was the one who created the attractive nuisance, the insurance company could pay the injured party, and once the insurance company has paid out, absent a waiver of subrogation, the insurance company would in theory be subrogated to the other person's rights, and, therefore, would be able to sue the person ultimately responsible. It is very important at times to demand that when the city obtains for you an insurance policy in which you are named an insured, you ask that there be a waiver of subrogation so that the insurance company, who can be a very rough animal, will not sue you. The insurance companies are business people; they have no concern for artists as they feel that everybody is a monetary human being. They will sue the person responsible, if they can find one. That is the only modification that I would make.

BERNARD FRAZIER:

Well, may I say something here? Mr. Feldman has written a book on this, and I hope that he will give us the title and publisher again, at this moment.

FELDMAN:

I think both were given. The name of the work is *Art Works, Law, Policy, Practice,* and it is published by Practicing Law Institute in New York City.

UNIDENTIFIED AUDIENCE:

Isn't it possible for the sculptor to have a contract agreement that states that all responsibility goes to the owner? And doesn't this free the from all responsibility?

FELDMAN:

Yes. I thought I stated that. If they indemnify him for any damages. Yes.

UNIDENTIFIED AUDIENCE:

As this is an international conference, I think you probably would like to know what I find is a general trend through the world, vis-a-vis the artist, the architect, and the contractor: We are finding more and more that the artist is a professional person. The artist is entitled to be treated exactly the same as the architect or the consulting engineer. The artist is not responsible for his materials; nor is the architect; nor is the contractor or the consulting engineer. We do not expect him to supply the steel and be responsible for it. The artist is a professional person and should be treated as such. He should be responsible for obtaining the price of the fabricator, and at the end of the day the patron should pay the artist's fee, then employ a fabricator under direct contract. This lets the artist out of all the shenanigans as far as responsibility is concerned in creating the piece or doing the work. It is happening in Europe; it is happening in Australia. I am surprised it's not happening in the States.

UNIDENTIFIED AUDIENCE:

I should like to hear some discussion on the rising costs over the last five years.

THALACKER:

The rising costs? Does anyone want to talk about the rising costs?

UNIDENTIFIED AUDIENCE:

They go up!

THALACKER:

Well, Bruce?

GITLIN:

Commodities are going up in price all over the world. It's straight supply and demand. You cannot control the price of steel, as it is dictated by the steel conglomerates. The labor costs are dictated by unions. Prices are going up, and there is no way of getting around it, except by doing the work yourself, or underpaying less-skilled people to try and help you.

ELOUL:

But there is another question, which is, you get stuck by the time lag between the time that you made your contract, when the information is fresh and relevant, and when the whole thing pops up like five, six, seven months later. That is how I lost money. You still have to come across with a work. Meanwhile, it just happens that your costs have come to a point that you are lucky if you are left with a thousand dollars on a $15,000 job, and all that sort of thing. It's the control of time, and that is where Mr. Feldman can say how you can manage. I think that all of sculpture is a problem of controls, really, control over materials, control over the process, control over the fabrication, over everything. How do you control this time factor? We are faced with it always.

GITLIN:

You can control the time factor in two ways. It is most important for an artist to have an escalator clause in his contract with whoever is purchasing the piece. This means, that as prices go up, and the published price increases, he gets an increased price on his sculpture, if the people who are buying it do not allow him to go ahead with it right away.

ELOUL:

Yes, but they have a ceiling on the budget, and they say for you to work within it.

GITLIN:

Then they are in trouble.

ERIC GIBBARD ,AUDIENCE:

But surely that is the point that I was making. If that artist gets a fee, and the contractor gets an artisan's contract under the bill of contracts of the building, he already practically has an escalation clause.

ELOUL:

Your point is not good enough. Your point is that what happens is that what happens is that the artist works for a fee. Anybody who works for a fee does not have control over the work. The main thing about the artist is that he has to produce the work, and he is the only one who can imagine it, because it has not been done before. And if he does, if he gives up the work, the control over the money, what happens to him is that he gets a fee, but the one who controls the money will control the work! He might say, "Change it." Like with architects. What happens with architects? All of a sudden in the middle of the work, they say to put two more floors on it! And he will do it!

THALACKER:

We have only a few more minutes left, as the bus is leaving at 6 o'clock. Let's try to keep the questions short and brief and move on fast. Yes?

UNIDENTIFIED AUDIENCE:

My question is to you, Mr. Thalacker. In your introductory remarks, you said that some of the pieces installed by the G.S.A. received bad reactions from the public. What happens to these communications, and what effect does this have on the G.S.A?

THALACKER:

The incoming protests are in three ways. That is, they are direct to me, they are through the President of the United States, or they are through the congressmen. In any case, they all end up on my desk, and I write a responding letter back. Does that answer your question?

UNIDENTIFIED AUDIENCE:

I hope that the G.S.A. does not take these protests too seriously.

THALACKER:

May I say something about that, briefly? The question was that he hopes the G.S.A. does not take those protests seriously. As a matter of fact, G.S.A. does take the protests seriously, and they have to, because, among other things, the congressmen,

also, take them seriously and it is something that you should be aware of, and you people should fight for. Encourage your friends and your mothers and your children and your lovers to fight for, too. And that is this: You should know, when pieces go in, that they generally will receive vocal and hateful responses from some people. If the people in power only hear those vocal, hateful responses, it is reasonable to assume that they will think that that is the public reaction, when in fact, it is not. So it is a distorted public reaction, and what you people have to do is write your letters, too! Write letters to the editors, write to your senators and representatives, and so on, if you like a work of art, a public work of art. Let them know. It will be very helpful, I can assure you.

HATCHETT:

May I add just one thing? The artist can help in a number of ways, especially when you are buying your materials and can prove that you bought them in the area where the sculpture is going to go, and if you hire people like veterans and minorities. I have done this. And when the protests came in, and they always do come, that was a great deal of help, to get us off the hook with many of the people.

THALACKER:

Thank you very much.

ART AND TECHNOLOGY—THE FUTURE WAS YESTERDAY

Kurt Lauckner, Moderator
Jeff Bangert, Kansas
William Fetter, Illinois
Kenneth Knowlton, New Jersey
Rockne Krebs, Washington, D.C.
Athena Tacha, Ohio

KURT LAUCKNER:

To begin this program, I should like each of our panelists to give a short presentation (his own introduction) rather than my trying to do the introductions. Each person has slides he would like to show. We will lead off with Rockne Krebs.

ROCKNE KREBS:

This piece was at the Kennedy Center in Washington, D.C., with the Potomac River in the foreground. It is called *Irish Light*. The piece forms an equilateral triangle, a mile on a side. Each laser is one mile apart and one mile from the Kennedy Center.

This is a more recent work in St. Petersburg, Florida, called *Star Board: Home on the Range (Part VI)*. A framing vista is created by the window of the building. The object itself is part of the overall collage of the sunset. Beams move in one-quarter arc second pulses once every 130 seconds, so it is not a kinetic piece in the usual sense. They move across a series of mirror facets that are roughly on-half mile on their axis, and create structures that move out over the city of St. Petersburg. This view is one and a half miles from the sources. The beam is the main axis of the piece. The other beam is in motion at the rate I mentioned making configurations around the other four beams. This is a view of the configuration we saw from about a quarter of a mile away. At the transition between the upper and the lower levels of the piece, the beam moves across the back of the reflective grating, and the light is dispersed into separate colors, six in this case.

This piece is in the New Orleans Museum right now.

This piece was made in 1970. A single argon laser was beamed at mirrors mounted on trees, which caused the piece to sway. One of the things that I enjoy about lasers outside, is that they can become enormous in scale. That is, they can accumulate a great deal of space; they can expand from another space into your space; and it is that accumulation of space that fascinates me.

This laser piece at the Baltimore Museum is called *Cut Flowers*. Fresh lilacs were put into the room every day.

That is from the top of a building. The Los Angeles County Museum is below it.

This was called *Night Passage*.

This is *Day Passage*. It was inside the Los Angeles County Museum.

At the Walker Art Center, the beam is skipping off the surface of a little lake.

That is *Home on the Range*. A single candle was the light source.

This is called *The Study: Home on the Range (Part IV)*.

This piece is called *Light Is the City at Night*, and it used to be in New Orleans. One of the problems with lasers is that they are a little tedious, tempermental, and difficult to work with. They are referred to, not as products, but as a state of the art. This came from the top of a building down to the street level. I think the laser is still there, and the mirrors also. I do not know why it isn't operating.

This is a spectral piece done some time ago. These little drawings that you can do for fun zip through space!

This was on the Niagara Gorge. The Canadian hydroelectric plant looks a great deal like a natural cash register and on top of it, I have an argon laser. The beam spread is about seven arc minutes. It is a mile away. There was a single vista into space.

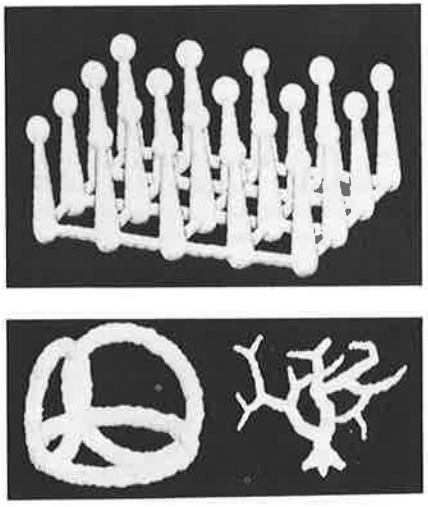
LAUCKNER:

Thank you very much, Rockne. The next person to say a few words is Dr.

Knowlton of Bell Laboratories.

KENNETH KNOWLTON:

There are a number of problems in dealing with technology and computers and their application to the arts. One problem is that computers are hard to get access to, and another is that they are hard to use because you have to understand a lot of things. A third problem is that many of the results to date are not only rather austere, but antiseptic. One of the things I have been trying to do is to provide systems which give a little more flexibility and interaction, particularly, for working directly with the computer to form three-dimensional objects (possibly for architecture, for industrial design, and for sculpture). We form objects while you are right there at the computer, and to allow the computer to help you to visualize, preview, and experiment with your ideas, fantasies, and notions. We build things that do not really exist in space, but exist only in the computer, to give you an idea of whether or not they are what you want to build as actual products.



Kenneth Knowlton

Now, some slides.

What you see here are objects made of blobs, in depth, defined while sitting at the computer. One defines cross sections and then the surfaces of revolution, perhaps with probabilities to slightly jiggle positions. One edits the things built by taking parts away and redisplaying the results. One can add something to it; use different colors; use different sizes and shapes; draw lines that are straight or squiggly, and thereby, hopefully, make things that are a little bit less regular. Or, starting with something that is regular, like this: maybe redo it, using a slight graininess to give it a bit of texture; make a copy of it over itself with smaller size blobs, with slightly more variation in position. Whether you like it or not, I hope you will respond in some way. The point is, that I am trying to get away from the very geometric things and gain the ability for doing somewhat freer-form things that have (maybe) some human meaning. My hope is that by the time this is formulated into a complete language, people will be able to learn to use it, with a three-dimensional choice, to be able to juxtapostion things, and therefore, have more control and somewhat more freedom in defining three-dimensional objects, looking at them from different directions and making transformations on them resulting in something, somehow richer and more organic.

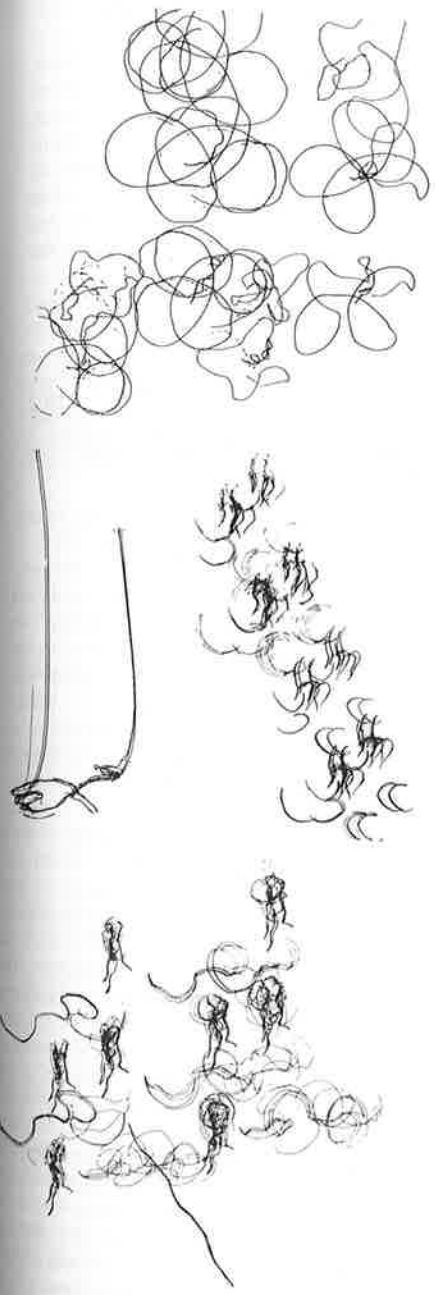
LAUCKNER:

Thank you very much, Ken. Next we have Jeff Bangert. Would you like to say a few words?

JEFF BANGERT:

There are really two people represented here—my wife, Colette, an artist, and myself, a computer person. We will go through a few slides of Colette's handwork and our joint computer pieces very quickly, but first, a little commercial.

If you are interested in seeing some more of our stuff, get a copy of the last *Proceedings of the Eighth National/ International Sculpture Conference, 1974*. We have a paper in it that talks about the things we do.



STRUCTURE STUDY:
BLACK, BROWN, RED, YELLOW
LINE STUDY: TWO DOUBLED FIGURES
STRUCTURE STUDY
STRUCTURE STUDY

Photographs are of recent work by Colette and Jeff Bangert, using a program CSB04C written by Jeff, and run on the Honeywell 66/60 computer at The University of Kansas. In each drawing, figures are put together to create a larger structure. This structure is embellished with a line which, though generated by a computer program, seems to have hand-made qualities.

Instead of getting deeply into our current work in computer art, I will comment a little on the history of art and technology, identifying what I see as a problem and proposing a solution that may scare some people.

The history of art and technology from at least the 1920s has been one of a few brilliant solutions to problems and some beautiful pieces. But overall, it has been a history of "highs"—"Oh boy, we're going to do this, bump," and "I'm going to do this, bump,"—enormous enthusiasm followed by "downs." The whole field now is in a "down" period relative to the 1960s, which were years of enthusiasm. Right now there are no big projects going. There are individual artists like Rockne doing beautiful things, but it just is not one of those fields that many people are working in currently.

Let me see if I can identify what I think the nature of the problem is. First, I have to point my finger at artists and say, of this group of people, that one of their characteristics is a certain antagonism towards the aesthetics of the man on the street, the ordinary person. There was someone yesterday who asked the question, "What about art that my parents would appreciate?" This is the problem. The world of art is somewhat antagonistic to the aesthetic feelings of the person out there on the street. Now we are not all technologists. Most artists who want to do art with technology have to work with someone else. If a person is an artist and says, "Hey, I'd like to do computer stuff," most of the time, she/he needs a programmer. And here is the problem!

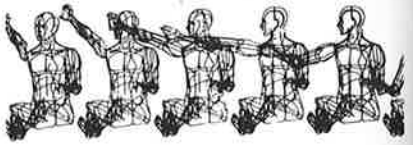
The aesthetic sensibilities of the programmer are likely to be those of the person in the street. Many of the people that I talk to are nice people, but when it comes right down to it, the artist says to the technologist, "Hey, you do this. You don't really know about art, but I do, so just do your technical thing." And since this programmer/technician is a real person, a real-live honest to goodness warm, feeling body, I think in the long run, she/he feels some antagonism. I think she/he feels some anxiety. I think over the long haul she/he says, "Wow! I really don't want to do this stuff." That is how I view the particular problem of why there is not a lot of technological art, compared to other forms of art right now. If we focus on the collaboration between the artist and the technologist, the solution is obvious. Artist and technologist must agree to collaborate aesthetically. For some artists the solution may be painful. Sorry. It is simple, though. It occurs when the artist sits down with a technical person and says, "Now let's do some technological art, because I think it's cool." The technologist will often say, "I think it's cool, too." Then the artist says, "And when we're done, we're done, we're both going to like it." And the technologist says, "Right on!" In other words, I see the possibility of some kinds of collaboration in the future of art and technology, in which the artist simply gives up her/his ego; gives up her/his particular "aesthetics," and says, "Hey, we're going to be two human beings working together; I need you, technologist, and when we finish our piece, both of us are going to like it." My feeling for the world of art is that, no matter what happens, there will be quality art produced, and I think quality art can be produced in this cooperative mode.

LAUCKNER:

Thank you, Jeff. Bill Fetter has some slides.

WILLIAM FETTER:

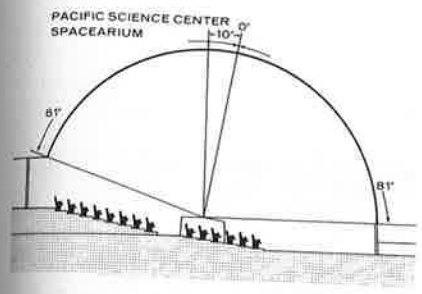
I think that Jeff addressed an interesting problem, and therefore, I will try to tell you a little about the working procedures that we used in the past. I will also give you a glimpse of some of the things we are doing in the computer graphics research at Southern Illinois University in the Department of Design. Some of this grew from work that I did at the Boeing Company.



HUMAN FIGURE PLOT

In this slide you see an anthrometrically correct computer graphics human figure plot which was used in design studies of cockpits and other applications. These technological developments have tremendous possibilities in the field of pure aesthetics as in sculpture and in mixtures of design and aesthetics, as well as in purely functional purposes. It is a generalized capability. Strangely enough, this technical capability has been shown in a number of exhibitions around the world as an interesting aesthetic piece, perhaps because we paid attention to sculptural qualities, for example by identifying lines that ran roughly along the points of minimum radius of the human figure, which approximate likely shadow edges. Currently at S.I.U.—C. we have a National Science Foundation grant, in which we are studying further ways to arrange an animated figure for anthropometrics, and other design purposes. There is, however, no reason that we cannot ultimately get beyond these crude figure representations to dance and sculptural works at the same time that we are applying it to medicine and other sciences. This is just one plot in an array of planned figures with increasing order of complexity.

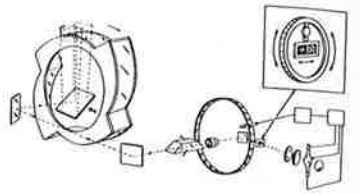
Another current project that had its roots in my work at Boeing, is a hemispheric projection capability. I have heard some interesting statements at this Conference about monumental, public, and large-scale art. The ability to simulate such a new design in three-dimensional space and literally be immersed in it spatially before construction begins, could be of tremendous value to sculptors. A single plot of film for hemispheric projection may be produced by computer graphics. This program that operates something like a fish-eye lens, so that when it is reprojected in a hemisphere overhead, you can then recreate the total environment with all



SPACEARIUM

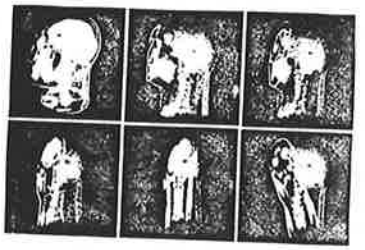
visual angles correct. Here is a slide diagram of the facility in Seattle in which we are going to make our tests. We will ultimately have computer-produced film, and the computer production need not be limited to the line treatment that you see in the test grid. Color, light, and shade will ultimately be used, hopefully including the type of capability that Ken Knowlton showed in his presentation at this Conference. We currently have grants from N.S.F. under way to pursue this. Again, these are techniques that will have technique life breathed into them when creative applications are attempted.

This slide describes a machine called the synthalizer, which permits you to create what appears to be a true three-dimensional object. Assume



SYNTHALIZER SCHEMATIC

that the rachet on the left, is whirling, and at the same time projecting carefully co-ordinated images on that translucent surface as it moves at a progressively different height. If you do this properly, it acts much as a motion picture, regenerating moving images, in this case regenerating images in a small volume. This is similar to a technique I developed early at Boeing. We now have the synthalizer at S.I.U. and are beginning to work on a means of producing computer graphic film, as I had already done experimentally with the supersonic transport fuselage while at Boeing. In a machine



CROSS SECTION OF THE HUMAN HEAD

originally designed for medical studies, images are created from frozen cross sections of the skull, of which you can literally eliminate whole sections to study internal structure. I talked with an instructor here at Tulane who said he is trying to accomplish the same ability in his art classes to understand underlying structure in the figure. So I think you can see that these computer graphic techniques as they are developing now, could in fact permit study of many internal and external

shapes and permit a "walk" around and within them to help select the best of alternative designs.

LAUCKNER:

Athena Tacha.

ATHENA TACHA:

I agree with Jeff Bangert about the problem of the distance between technique, people, and artist and public and artist. That is why, for the moment, I have abandoned technology until the problem is solved and have gone into public art. I believe we have to reach the wider public. One solution could be an explanation on the part of the artist. The artist can become an explicator. How much I can explain in five minutes is very doubtful, but I will try. I have chosen only three works to show you as representative examples of my work of the last year. This is a piece that is going to be executed probably next month in Cleveland, a bicentennial sculpture competition that I won last fall. It is a square with cuts in it which allows it to open to a series of arches, the sides of which are different colors. It is the closest that I have come to what most people call monumental sculpture and which I call more object sculpture because my other outdoor slab sculpture is more environmental. As a matter of fact, it is not really quite an object because it is conceived for that particular environment. The dimensions are about twelve feet high by twenty-four feet long, so that persons can pass comfortably under the arches. Some of the interesting things about it are the variety of views and the close volumetric shapes it presents from certain points and the partial openness it presents from others. The walking aspects of it, is appropriate for the space, for it is a mall along which people and traffic constantly pass. There is a surprise aspect: as you pass along, it totally changes color. It can be captured in a single glimpse as you pass by car.

This is sight in Cambridge on the banks of the Charles River, an ugly spot, which I should like to transform into some kind of picnic area. This view from the side gives you an idea of the river. Cambridge is on the right. It is exactly across from Boston University. It was not designed for execution because I knew possibly I could not get it done, but that is what made me design it ambitiously. It would cover an area of 750 feet. The terrace is made of concrete retaining walls and curbs with pebble or earth-filled middle areas. The left side is curvilinear, the little figure there shows you the scale; you notice that they are not concentric at all. I want to avoid all the routine aspects of steps, where heights and widths are standard. I want to make step formations that are totally unexpected to the body and therefore create new rhythmic body experiences and new relationships, body to ground, as well as experiences that also expand in time. The other side was rectilinear.

CHARLES RIVER STEP SCULPTURE
Athena Tacha

There are two aspects of the water, one being the crystal aspect, as the river freezes which inspired me for this side of the sculpture. (The area was cut in the middle by the ugly train line.) The other side was inspired by the flow of the water. At the time of my visit in January, I experienced the double nature of water right in front of my eyes.

One of the main purposes in the step, outside that which I have mentioned, is spacial disorientation and new relationships to gravity. We are used to living in man-made rectangular spaces and being vertical on horizontal spaces. Obviously, all those are indeed conventions, and yet they are practically ingrained in us. But our grandchildren will be up in space where there is no up and down. I want to give a hint of that kind of experience to the present human being with both breaking all the rules against rectangularity and also playing with the feeling of horizontality and verticality.

TIDE PARK SCULPTURE Athena Tacha

Many of those steps already are around. You see that better in the third work that I am showing which is a small sculpture park for Smithtown, Long Island, a commission for which I am competing with two New York sculptors. You see that the sculpture is less ambitious than the Charles River model, and is more realistic.

This is a view from the street. It is a small city lot. The people give you the scale. It is more realistic in its making because the people in the town are going to choose the person who is to get the commission. That is one thing that I like best about the whole commission. It is a series of terraces, all curvilinear. The ground plan is projected mirrorwise on the adjacent wall. It consists of seven steps above ground at one-foot intervals, and seven steps below ground, the lowest of which is a pool.

This is the last view, a detail of the sculpture which shows the pool with the mural reflecting above it. I guess I will stop here.

LAUCKNER:

In the next portion of the Round Table, we are going to address ourselves to questions that are suggested by the title of this panel, "Art and Technology, The Future Was Yesterday." I think most of you realize that there is not a great deal of technology in art yet. A few artists have broken through with great personal sacrifice. We will address ourselves to the question of this barrier which seems to be affecting advanced technology art. In particular, some of the questions that I would bring to the panelists' attention concern economic barriers, educational barriers, inspirational barriers, availability, usability, recognition, collaboration, and acceptance. If possible, we should start with acceptance, and I mean acceptance by the traditional art world. Would any of our panel like to address that question?

FETTER:

This acceptance does touch on the issue that Jeff brought up, and I think that at the same time we have many ways that people are working and will be working together. I think this variety is just as enriching as the difference in the aesthetic works that are produced. I think we ought to preserve the possibility of many different kinds of relationships. For example, I know of some people who prefer to get their hands directly on every device needed and to personally complete every component part, whether in computer graphics, or sculpture. Others find they can work best by organizing and orchestrating both their own talents and work, and the work of others. There are as many different ways of working with other people as there are people, I suspect. And I think its important to preserve that variety and find out not just which designs work well, but what kind of interpersonal relationship yield successful works. That process is often

as exciting to follow as the art work itself , since it surely will produce new concepts and forms.

LAUCKNER:

I think acceptance usually means money, getting grants and so forth, and acceptance by the art world and from the National Endowment for the Arts. Rockne Krebs might have some things to say about that, since he has been funded.

KREBS:

I think people generally are ready to accept technological innovation, however, I have found that it is not enthusiastically espoused by a lot of artists because it is a pain in the ass and it is expensive. There are real skills that they need to apply to exercise themselves as artists and to produce good art, which do not have a great deal to do with those skills necessary to deal with some pieces of technology. Artists have always employed it. From the Chryselephantine sculpture of the Greeks to contemporary times, artists have always used technology. The acrylic polymers are as advanced in technology as the laser that I employ. The formal way of applying these things is different, but I do not think there is any trouble with acceptance. Usually the tools of technology that the artists have to use are inaccessible because of price and are difficult to sustain. I find that most of the 28 pieces that I have made no longer exist, even where they are supposed to. You know, they are beams of light.

LAUCKNER:

You have alluded to the educational aspects of things. I would say with no hesitation that there is not a single place in the United States that cultivates advanced technology art from an educational standpoint.

TACHA:

Yes, there is. The Minneapolis School of Art, for instance, has facilities for some advanced technology art forms, as advanced, let us say, as neon fabrication, etc., and, of course, video. But I think before we move to the educational, there was an aspect that you did not mention and which Rockne brought up—the preservation of the work. That's what gets me. You make a work that involves just simple little motors and simple little light bulbs, and if the museum buys it, they do not bother to replace the bulbs or bother to oil the motors, and so on. So why make it? I get disgusted with that.

LAUCKNER:

That must be something unique to the advanced technology art. Most people are familiar with shows like the *EAT* show in 1968, which had problems with materials and technology not working.

KREBS:

Well, it certainly disappears when it is not there. I had an opening in St. Petersburg, and my laser did not run. It took a day to get a technician in to fix it. That kind of thing can become discouraging as well as make it difficult to deal with the kind of people one has to deal with in a large public situation like that. That piece was totally public money, commissioned by the city of St. Petersburg, and voted on by the city council, and the whole rigamarole.

LAUCKNER:

Would anyone else like to make a comment?

BANGERT:

Yes, there is an aspect of acceptance that I feel very positive about. I think we all remember a time in the 1950s and 1960s when we, as artists, were worried about what was the movement, the movement today. Was it abstract expressionism? Was it pop art? I think we are now going to go through a period when there is no one movement. This means that If I am a marble sculptor, I can feel that my art might be perfectly acceptable, although I am not doing exactly what others are doing. If I am a technologist, an art technologist, I,too, can feel accepted, because I do not have to be doing exactly what this person or that person is doing. I feel very positive about this.

TACHA:

May I add to that? I think you are right. The great importance that was given to avant-gardism throughout the 1960s did account for a lot of the snobbish attitudes by artists towards both the public and the art technologists. But I feel that pluralism has started to exist, and I think that is very encouraging. On the other hand, aside from that acceptance of a lot of styles at once (and I must say that the woman's movement has brought about that acceptance to a great degree), to the point that the public understands any good art, or to the point where a scientist understands what the artist is doing, there is still a big gap. I think the solution to the problem of acceptance is education and mutual respect. The artist needs to educate herself or himself about the science of the scientist with whom he or she wishes to collaborate. And the scientist should do the same. There is also snobbery on the part of the scientists. They look down on artists as if they are idiots who don't understand a thing. I think both branches need to educate themselves about other, and then, of course, the public needs to be educated.

LAUCKNER:

Maybe we should talk about this collaboration.

KNOWLTON:

It seems to me there is an implicit assumption here that I wish to challenge or ask somebody to be explicit about. It occurs to me that there is an ironically-named organization here that many of us belong to, called the Association for Computing Machinery. It is as if computers were a minority group that we all ought to defend and protect and enhance the rights of. It is almost as if we were talking here in favor of computers and in favor of people accepting them and their products *a priori*, without really saying why. I mean, why should one want this sort of thing? Why isn't our approach first to say: what are the human purposes to be solved, to be served; how are we going to go about doing that as artists or as human beings.

APPLAUSE:

KREBS:

That is almost exactly the way I got into lasers. I had visual ideas that I was not able to realize by more conventional means. These were images that in some cases I had put down in drawings. I have never approached the laser any closer than that as a tool. I have acquired a bit of information about it, but it is a tool that allows me to exercise my ideas. Now, as long as those ideas remain of some fascination to me as an artist, then I will continue to pursue them with the tool. But beyond that, I think if one attempts to suggest that it is possible for an artist to float into the situation, I don't think artists work that way. I believe that they develop a kind of visual language, and the better they are, the more peculiar it becomes to themselves. It takes years to become good at even exercising that language, how to know what green to put next to what other color. You do not do it consciously anymore, you just do it. There is so much that is nonverbal about it. I think artists collaborate a lot, although they do not talk. They learn by looking at one another's activity.

LAUCKNER:

Let us look a little further at the idea of collaboration. I think it is an interesting thing. The one collaboration that seemed to be a fairly decent success was Billy Kruger and Rauschenberg in New York City. Would anybody like to make any comments about collaboration in general, and, in particular, between artists and scientists?

FETTER:

During the 1960s when much of this art/technology effort did begin, there were many experiments in types of collaboration, and one of the interesting things about that era was the over-acceptance of results by many people. There was a willingness some-

times, to simply say, "If that was done by a computer, then it must be interesting and good." Perhaps there was some validity to that because it was so experimental. However, we are entering a period when we should and can be more discerning. We are in a trend at the moment which will ultimately create a whole new thrust, perhaps not too many years from now, when some of the best of the interdisciplinary efforts will coalesce. Methods of collaboration are themselves an exciting area. For example, the work that Jeff and Colette are doing represent one very special area of computer graphics. The treatment of those lines are one type of approach, and though it is not the only work with that approach, the result is completely unique if you compare it with everyone else working in that direction. There is still a wide variety. I do not know to what extent you should try to design these interactions just let them happen.

LAUCKNER:

To follow up on this collaboration a little bit, I guess what I was tyring to pursue is the ego problem. I think a lot of it stems from the fact that the artist working in the collaborative effort, typically is doing this for a living, and the scientist has his own job and is just sort of participating, typically from the outside. I know that Ken does some collaborating with Lillian Schwartz. What is your feeling on that: Everything seems to have worked out well. Do you see any problems?

KNOWLTON:

Before that I also worked with Stan Vanderbeek, and the more I have collaborated with people, the less I have to say about it. That is, the fewer are the general statements I can make. It is all very specific to the situation, and to the particular areas of expertise that they are combining. The reason for collaborating is that there is just too much to deal with: too many techniques; too many areas of expertise; too many skills, and too much knowledge that comes to bear in this kind of work, with which one person can adequately cope.

LAUCKNER:

Of course, I think an example is Rockne Krebs. He did not collaborate; he dug up the information on his own, I presume, and with brute force, found out by making mistakes, buying his own equipment, and experimenting.

KREBS:

Well, there was some of that, but I did have assistance in several instances. Initially, I did just go out and buy a laser in 1967. It was a brash thing to do! I kept it in my studio, though I never did any exhibiting with that particular one. I had some assistance from Paul Halderman, an engineer at the University of Maryland, particularly concerning the safe use of this tool. Then I worked in the Hewitt-Packard Research Labs preparing for the Osaka exhibition in 1970 and learned a great deal there. That was a very real learning experience. But all the information I was acquiring was quite specific to a kind of thing I was trying to do. Much of it was not already known and is of no particular value to anyone else. A person finds his niche, and develops within it. But one thing that I see is the lack of education in the fundamentals. One of the problems is that there are too many fundamentals, and that is why these collaborations seem to start.

KNOWLTON:

There is one other reason for collaboration, possibly. Now I am not sure whether this is true, but it is something that I once wrote, and then it was quoted a lot. Now I want to retract it, almost, or maybe I do not. I don't know. Let me put it as a question. Do artists and technical people have very different dispositions?

TACHA:

Very different aims.

KNOWLTON:

Well, maybe aims too, but do they have different sensitivities and sensibilities and attitudes?

BANGERT:

One of the aspects of the difficulty of collaboration is the art educational systems. It doesn't usually reward collaboration on the undergraduate level. I can imagine two students in their freshman year declaring, "Hey, school, we're going to work together on everything," and the school would say, "No, go away." Working with another person is a skill itself; you have to learn how to do it. The educational system does not develop this skill. I agree with what Ken wrote, that one reason collaboration is difficult is that there are specific kinds of people with different sensibilities that end in specific areas like art.

KREBS:

If you're not crazy before you start, they'll get you when you get there.

TACHA:

That may be a cliche, though. I think there are kinds of art that absolutely require team work, like film making, and theater, and all the performing arts. It is ridiculous to say that artists are of such a disposition that they cannot collaborate. The artists themselves have created that image, it is true. There has been too much adoration of the ego. As Ken said, we will need more and more collaboration, since no one person can accumulate the knowledge that will soon be necessary and that you already need, to be able to cope with reality, and to create in the present world. So I think we had better learn how to collaborate.

LAUCKNER:

We should move forward to the next portion of our discussion and that will be the questions from the audience. We have two microphones on either side. Does anyone have questions regarding art and technology for the panelists?

BOB RUSSIN, WYOMING:

My question is about these images that the computer made. Are these actual physical three-dimensional images or photographs of possible images?

KNOWLTON:

Those are hypothetical objects.

RUSSIN:

Hypothetical in what sense?

KNOWLTON:

They are not three-dimensional. They exist only in the computer in terms of a mathematical definition.

RUSSIN:

They were in different colors.

KNOWLTON:

The computer produces a colored picture on a color television set.

RUSSIN:

I see, but they are not in fact three-dimensional. Are there any ways of making three-dimensional objects out of these?

LAUCKNER:

The nice thing about having an explicitly defined object in the computer is that if you wish, you can arrange to have the computer print out essentially a parts list, to give you an absolutely explicit definition of the pieces that would be required to actually build that object.

BANGERT:

Another answer to that question is, yes, there are devices that engineers use, called milling machines, many of which are driven by computers and actually have been used in the construction of sculpture. There are many intermediate ways of going about it. So the answer to your question is, yes, it is possible to construct a sculpture.

RUSSIN:

Where do you get information that is precise?

FETTER:

Large aerospace centers are involved in computer graphics, and master dimensions. The latter is a system of defining whole surfaces by mathematical equations and numerically controlled machine tools which take that equation, and cut the form out of metal, in some cases, 90 feet long—enormous machines with great complexity and power. Their current products are already works of sculpture and yet a sculptor should somehow have an opportunity to use them.

LAUCKNER:
I think a point should be made here. As Ken has remarked, this material that he is developing is really to help the artist experiment.
KNOWLTON:
Yes, the point again is that this is a way of building things, testing, looking at them, and changing them. The one thing I wanted to say, and let me say it now, the pictures that you saw, 20 pictures, were of about thirteen objects and variations. Those objects I built, as it were, in one six-hour period. I did the exploration and photographing in that time. Whether or not they are great is beside the point. If you are tooled up to do it, it is possible to do a great deal of exploration in a relatively short time and have several looks at several different things, or several looks from different angles at a single object, or a single group of objects.
LAUCKNER:
In other words, it is possible to try out several hundred ideas.
KNOWLTON:
It's very flexible.
LAUCKNER.
Are there any other questions?
CHARLES PRITCHETT, LOUISIANA
May I ask where the panel thinks the proper place for aesthetics is at this particular time in computer art? Do you have to have an artist there looking at the computer, saying "Yes, that is good. No, we throw that one away." Or is it possible, for example, to put together a computer program that would produce only good art?
LAUCKNER:
I have a remark. Harold Cohen, who spoke two years ago on a panel at the Conference, has a program that generates art. I want to be careful how I say this: it is a very ambitious project, related to artificial intelligence. He was inspired by the petroglyphs in the Southwest. Noticing that about eighty percent of these petroglyphs seemed to be saying something, although nobody knew what they were trying to say, he decided there was something there. The people intended something to come out, to express themselves. He has a generative type program, one that does not transform a vocabulary, but generates art.
BANGERT:
This happens to be an area that I have some strong feeling about. Computers do not appreciate art. All the museums I have ever been in have people, not computers, in them looking at the art. Computers do not create art. If we stopped all the computers in the world, there still would be art, but if we stopped all the people, nothing would happen. It is essential that there are warm bodies doing something before art gets produced. But it is quite conceivable that a warm body, called an artist/programmer, is going to sit down and write a very complex computer program, that, when it runs, is going to produce all kinds of fascinating and interesting things which, by whatever standards happen to be operating, might all be called good art. It is conceivable. I suppose it comes down to the point of, is it really interesting? But, yes, it's conceivable.
KNOWLTON:
The problem isn't that computers cannot determine whether or not something is art; the problem is that people cannot specify clearly and precisely. If a person could specify precisely whether or not something is good art, then that could be translated into a computer program which could do that process, and come up with yes, no, or maybe.
TACHA:
I remembered what I wanted to say, and it is related to your question. The problem goes back to collaboration. The problem is that artists think they know what is good art, and in most cases they, the art critics, and the art world are right. Scientists usually can't judge art—they have their own specialty; artists have a very naive idea of what is science, what constitutes the specialty of a particular scientist, as the scientist has a very naive idea of what is good art, usually. And that constitutes the barriers between the two, and leads up to a lot of mistrust. In other words, I think that if an artist went to the technical person with whom she or he wanted to collaborate, and said "Let's make art that will please you," well, that art wouldn't please the artist. So whom do we have to make the judgment? In my opinion, the artist has to educate the scientist, and the scientist has to educate the artist, so the final product comes from both. Also the aims are very different, because the scientist has usually a very utilitarian aim, and therefore doesn't care about some of the things that come about as a result of an artist's research. Like what Rockne said, a lot of things that he learned or discovered about lasers through his work wouldn't be of any use to any one else. However, one never knows what is useful. It is because scientists have blinders, and they don't see that the artist could lead them to discoveries that would also be useful in their work, of course, vice versa. Scientists often treat artists very condescendingly, and vice versa.
LAUCKNER:
Very well. We have further questions from the floor.
UNIDENTIFIED:
Responding to what Dr. Knowlton just said he is assuming, I should like for him to continue, in mathematical terms. Is there an existence theorum? Does a definite definition of good art exist? You are assuming that there is, and that if we knew what the definition was, we could then program the computers. But I'm asking you, does such a definition exist?
KREBS:
The way one would have to approach that would be to take a great work of art, maybe Rogier Van Der Weyden's, *Descent From the Cross,* at the Philadelphia Museum. I suppose it is possible to capture that image in the computer program. If so, one would have a great work of art every time the program was played. There is no definition, no single definition that could apply to what is good art.
BANGERT:
Consider a book, the title of which is *Definition of Great Art.* I will tell you frankly, I do not think I would read it.
LAUCKNER:
We have another question.
DAVID RODGERS, INDIANA:
I'm a sculptor. Can the scientists on the panel define what they consider creativity in science? If you could make a statement on that, perhaps you might be able to answer your question, because I think creativity in any area is still creativity, and that is not polylogical. What is creative science, and if you have a creative expression of science, how do you communicate that to the public?
No response? I don't accept that.
BANGERT:
I am sorry to seem negative, but it is not necessary to worry about the creative process. The fact that you came to this meeting means you must be a person who does something creative. I can guess that, but I have no reason to suggest that you should worry about it. As a person who writes programs for computers and thinks about computer science, I honestly do not feel I have to worry about thinking about computer science.
RODGERS:
But you were talking about the scientist having to educate the artist about science.
KREBS:
Everyone has to be educated about science. One of the problems the artist experiences, and it is the same problem essentially every layman experiences, is that science has developed languages the average person cannot approach to truly appreciate what is going on there. The same thing has occurred in the arts. I do not think either form is about to be completely disseminated and understood at its highest level at this time. It is simply going to take some time.
TACHA:
However, to be sincere about it, I feel

that the scientists are making a better effort to vulgarize (to use a word that may sound pejorative) or disseminate the information on the layman's level in each of the sciences. For example, *Scientific American* is a perfectly readable magazine. I have no scientific background, and yet I feel that I can keep informed about progress in the different sciences. It is difficult for anybody to try to read the *Art Forum.* The uninformed, even the informed world, often have a great problem in comprehending some of the articles. So the artists and the art critics have not made quite as good an effort to be clear about art. Of course, they claim that art is not as clear-cut as science. But, I disagree. I think it may be a little harder to explain or define. Creativity, on a real level, is equally hard to define in both science and art.

LAUCKNER:

At this point we will have to end our discussion. Maybe one more question.

MARSHALL STEVENS:

I'm a writer from San Francisco. Do the artists feel that their art has any value politically? Considering the fact that science is responsible for this horrible planet that we are experiencing, and the artist is supposedly the aware person in society, who, then, is ahead of science, and ahead of thought? Do you feel that your work has value as far as alerting the world and alerting the scientist to our problems? Is that a motivation for your art, or does your work make us all feel good just because it is beautiful?

KREBS:

There are political things that the actual work I execute does do. It is not a Republican or Democratic issue, but it addresses itself often to the context in which art is experienced. These large scale pieces which introduce a collage into the familiar, comfortable landscape—pieces that may be a home, in fact—introduce a different context for looking at art. Most of the time, people don't think I am making art when they see these things. That is all right with me. The inside piece just finished in St. Petersburg, was in the Marriot's banquet room. The location intrigued me, because it is not the museum situation in which I am used to working, where because of the context, a kind of separateness and preciousness may develop, making the object more difficult to experience and approach. These can become political issues, I suspect. But my basic feeling is that the artist *will* assimilate political ideas, and the less self-consciously he employs them, the less he thinks about them, the better off he is in terms of his work. Whatever convictions he has will surface in the work.

KNOWLTON:

I resent the implication. First of all, the question is addressed to artists alone; secondly, it is a very simplistic statement, saying that our problems are due to science and technology. If you think so, you are welcome never again to ride in a vehicle that goes on wheels and uses fossil fuels. Do not use telephones.

TACHA:

I'd like to answer too. I don't deal with political issues on the narrow, every day level in my art. I deal with them as an individual by supporting, let's say, a Democratic President or whatever. I think those are in the long run very ephemeral, trivial questions. The deeper social issues, and the deeper human issues are indeed very much in the core of my art, although they aren't nearly as obvious. The fact, for instance, that I'm trying to humanize art and make people aware of the dehumanization of our environment, as well as bring the rhythms of nature, the universe, into the consciousness of people, shows the social intention of my art. I can fight as a feminist in my private life; I don't have to do it in my work by painting feminist manifestos.

LAUCKNER:

We do have a problem of time, unfortunately. I promised that we would be out of here by 5:30 p.m. because there are some other events coming into this building tonight, and the television equipment has to be dismantled. If the people on the floor who still have questions would please come forward, I'm sure the panelists will be glad to answer you individually.

Thank you very much.

I wish to gratefully acknowledge and thank Colette Bangert for her contributions to the Ninth National/International Sculpture Conference, not only in organizing the Art and Technology segment, but her advice and assistance to the entire program.

Elden C. Tefft, Director
International Sculpture Center

SPRAY METALLIZING

(The Industrial Technique of Sprayed Molten Metal Adapted for Sculptural Use)

Jeffrey J. Bayer
Alabama

It is possible for the contemporary artist to increase his visual vocabulary by expanding his materials and techniques. The University of Alabama in Huntsville sculpture program, which investigates the conversion of commercial materials and processes for sculptural use, has adapted the industrial technique of spray metallizing for studio application.

Spray metallizing is an industrial process of spraying molten metal onto a surface to form a coating. Pure or alloyed metal in the form of a wire is melted in a 6,000 degree F. flame and atomized by a blast of compressed air into a fine spray which builds up onto a previously prepared surface to form a solid metal coating. It is used in industry for many purposes, mainly for the repair of worn equipment. Architecturally, it was used to provide a copper coating on the Guggenheim Museum's cast concrete parapet. Many metals, both ferrous (iron-bearing) and non-ferrous, can be used. The sprayed metal is a new metallurigical material with different physical properties than the original; it is generally harder, more brittle and more porous. Metals which can be sprayed include stainless steel, zinc, aluminum, cadmium, bronze, brass, copper, steel and nickel.

The equipment used in this application is portable and the process is much like spraying paint. Metco Inc. of Westbury, Long Island, has developed the equipment best suited for sculptural adaptation. The process was invented in 1910 in Switzerland and first involved spraying heated metal powder. A few years later the wire gun, which is the most versatile, was developed. Many other types of systems have been explored, such as the electric arc gun and the crucible system for melting the metal prior to spray application. The wire gun process was introduced in the United States in the 1920s. Recently, Metco has developed its "thermo spray" process for applying high melting-point metals and ceramics utilizing powders. This system is not as economical for the sculptor, nor does it provide the variety of techniques that the wire process permits.

A metallizing installation requires an air compressor, regulators for the oxygen and acetylene gas, flow meters, wire control unit and a metallizing gun. Auxiliary equipment would include grinders and a sand blaster. The metal

SPRAY METALLIZING INSTALLATION

used is in the form of a 1/8 inch diameter wire. The actual cost of the spray metallizing process per cubic inch is quite low, and it is possible to compute the total cost of the needed metal and gas prior to application.

An air compressor with a capacity of 30 cubic feet of air per minute (cfm) at 55-65 pounds per square inch (psi) pressure is required. This is a large machine generally powered by a ten-horsepower motor. This compressor will also drive any pneumatic tool one might wish to employ in the studio. The large capacity (cfm) is needed to drive the air turbine which feeds the wire through the gun, as well as supplying a continuous blast of atomizing air to spray the molten metal. A unit, to trap and remove moisture and oil from the air supply lines prior to its entering the metallizing system should accompany the compressor. This practice is common with the use of all air-driven tools. A regulator is used to adjust the air pressure.

As a tank each of oxygen and acetylene is used in this process, regulators are required. These should be two-stage for finer control and are identical with those used for oxy-acetylene welding. Good quality is important to minimize pressure creepage. The regulated oxygen and acetylene are delivered next to gas flow meters for further adjustments. The welding regulators only indicate pressure, not the flow of gas. Clogged or kinked hoses, line pressure drop, fittings, and the metallizing gun itself all affect gas volume. Consequently, flow meters are used to insure proper and accurate operating conditions. A flow meter is also used in conjunction with the compressed air. The wire control unit is designed to hold the metal and straighten it as it uncoils. It is, in essence, a large lazy-susan supported by a tripod.

The Metco 10E can be considered as an all purpose gun. A single set of gears sprays both hard and soft metals. An air turbine drives the gears which grip the wire and passes it through the 6,000 degree F. flame. The speed of the wire and the gas flow must all be adjusted so the wire burns off at the proper rate and is atomized by the compressed air issuing from the air cap on the gun. This process is continuous. Though the operator must contend with an 1/8 inch diameter metal wire traveling from the air handling unit to the gun, the 10E is balanced for easy hand spraying. There are only three operating controls on the gun. The gas head valve controls the flow of gases and compressed air to both the nozzle and turbine. The gases are ignited with a spark lighter. The speed control ring adjusts the rate of wire feed and the wire grip handle causes the drive-rolls to grip or release the wire. It is a simple, quick operation to change from one metal to another. For jobs requiring large amounts of metal, the 10E is capable of spraying 3/16 inch diameter wire if an adapter is used. For almost all sculptural usages, the 1/8 inch wire set-up is sufficient. It sprays at a high speed, deposits at a low cost-per-pound and is easy for the operator to handle. Some loss of spray mobility is experienced with the thicker wire.

The structure of sprayed metal is quite different from that found in cast, rolled, or drawn metals. The sprayed surface is composed of small, flattened, interlocking metal particles; hence, ductility, elongation and tensile strength are greatly reduced when compared to the same metal in a cast form. It is possible to spray up a flat sheet or a three-dimensional shape and release it from its male or female mold.

When sprayed metal is applied to a flat surface, a tensile stress is set up in the coating. This results in a compressive stress at the surface of the base piece; hence, if the base is thin, it may be deformed. If, on the other hand, the base is thick, the coating may lift.

Proper preparation of the surface to be coated is of paramount importance if good adhesion is to be achieved. Obviously, degreasing is in order, and if possible, grinding or abrasive blasting. Roughing the surface increases adhesion since the laminations of sprayed metal particles are folded up and down over the relatively large grooves or bumps. On large flat surfaces, the edges of the sprayed metal will tend to lift due to the shrinkage of the hot coating upon cooling. Grooving, accomplished by a rough disc sanding, will minimize this problem. Two other methods can be employed. The base metal could be expanded by heating prior to spraying to reduce the shrinkage factor, and/or a low shrink metal such as zinc could be utilized for part of the coating before the "finish" metal is applied. Obviously, undercutting an area prior to metallizing would insure a firm mechanical bond. This is appropriate when repairing a foundry casting.

Metal can be sprayed into a mold, oversprayed, sprayed on metallic or non-metallic substrates and used in conjunction with the foundry. When oversprayed, the resultant surface is pebble-like not perfectly smooth. No detail will be lost; however, grinding or sanding would be required to produce a mirror surface if desired. Copper and bronze can easily be brought to a high, reflective polish by sanding with aluminum oxide papers, starting with No. 40, then No. 80 and No. 120. Wet and Dry papers are next used beginning with Nos. 320, 400, 500, 600 and the work is finished with rubbing and polishing compounds.

Sprayed into a mold, the metal picks up both the mold surface and texture as well as its depth of gloss. Reproduction is quite precise and since the metal particles are sprayed against the mold walls, the resultant metal surface is as dense and smooth as the original pattern.

Masking is accomplished with the use of tapes or the application of an oily substance. The more effective method is to use Metco's Masking Compound, which is a water-soluble material which can be brushed onto any surface to prevent adhesion to the sprayed metal. This is better than grease or oil as these materials tend to "run" when heat is applied via the coating process.

Plaster, concrete, paper, cardboard, fiber, fabric, ceramic, wood and many plastics can be metallized. Spraying a hot metal onto a material with a low-burning point increases the potential of scorching or warping. Much research was done at the University of Alabama in Huntsville sculpture facility to develop techniques for coating non-metallic surfaces. Zinc is often applied first, as this inexpensive metal coats at such a low temperature it may safely be applied to most materials. It then forms a protective heat shield so that most other metals can be sprayed over it. This writer has used this process extensively on his own sculpture by spraying bronze, copper, aluminum, and zinc onto rigid urethane foam cores. The resultant sculpture is light-weight, strong and weatherproof. The surface may be ground mirror-smooth or finished to exploit the sprayed metallic texture.

Salt and pepper effects are easily accomplished by a light over-spraying of different colored metals. The inherent colors of bronze and copper can be produced by the same methods used in foundry practice. Patinas ranging from the blues and greens to the oranges and reds are easily produced using traditional recipes.

The author has helped adapt the metallizing potential for the other visual arts. The process, when adapted by the weaver or fabric artist, permits a weatherproof, durable, and if desired, free-standing work. It is possible to metallize a fabric and still retain its inherent texture or to completely deny the weave. At U.A.H., techniques were developed for the painter, and successful methods were identified for rigidizing shaped works and coating primed and unprimed canvases.

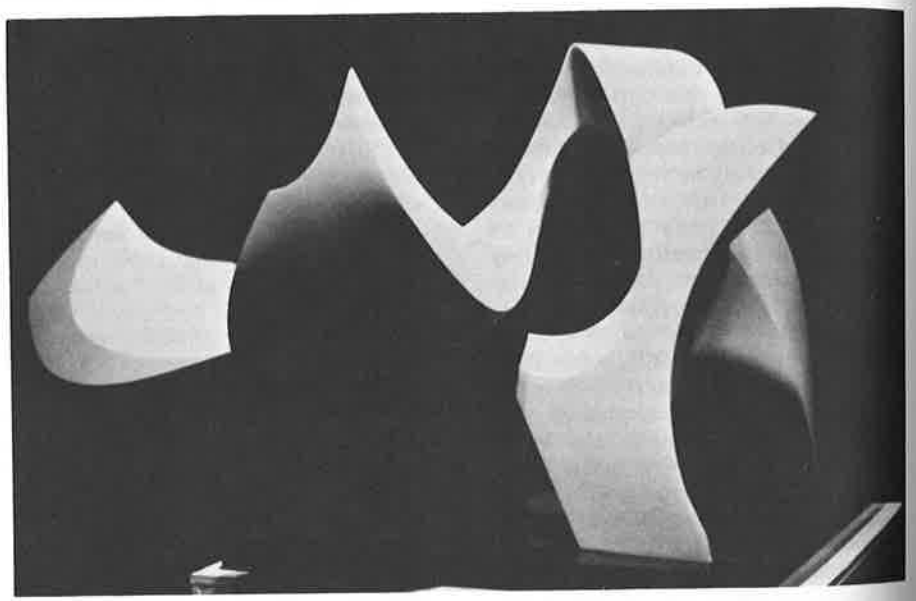
Metco metallizing wires are produced to close tolerances and are finished with a lubricant to lessen nozzle wear. Their temper and alloy are controlled for successful coiling

and spray operation. Various alloys of bronze, aluminum, steel, nickel, and lead are available.

More often than not the sculptor will select the metal by its color in order to achieve a desired aesthetic effect. The wires are sold in either 25 or 50 pound coils. Some metals are priced in 50 pound lots with a splitting fee of approximately $5.00 for a minimum order of 25 lbs. Zinc is one of the less costly metals, hovering close to $1.00 per pound. Aluminum and copper are close to $2.00 per pound and the bronze alloys have a price range of $2.00 to $4.00 per pound. A small investment in materials can coat many square feet. For example, one square foot of copper sprayed at a thickness of .030 inch costs approximately $4.00. Less than two pounds of wire are needed. Metco Inc. has been enthusiastic and helpful in converting the metal spray process for artistic use. An installation, less compressor, would cost approximately $3,500. It would consist of the following:

one each, 10E - 1/8 inch Flame Spray Gun
one each, 2AF Air Flow Meter
one each, 2GF Gas Flow Meter
one each, 3A Air Control Unit
one each, 6H Hose Unit, 15 feet
one each, 2W Wire Control Unit
one each, 3G Gas Control Unit
(oxygen and acetylene regulators)

A first order might consist of the following wires in 25 lb. quantities: zinc, aluminum SF, copper, and spray bronze C.



METALLIZED NO. XXI Sprayed zinc over a rigid urethane foam core Jeffrey J. Bayer

The piece weighs less than 40 lbs. and measures 4½' x 2' x 2' high. The cantilevered form which extends 4' of the sculpture's 4½' length is only supported at one point. This exhibits the great structural potential of combining the contemporary material of rigid urethane foam and the industrial technique of spray metallizing. The sprayed zinc surface is left in its textural state (Photo by Linda Bayer)

DALIC PLATING

(The Industrial Technique of Brush Plating Adapted for Sculptural Use)

Jeffrey J. Bayer
Alabama

Brush plating is a process of selective plating without the need for immersion. Unlike many industrial processes adapted for sculptural use, this technology can be used with little or no modification in technique. Since the plating tool (the anode) is hand held, the procedure is analogous to painting with metal. The anode, which is connected to the power pack, is wrapped with cotton batting which is saturated with the appropriate metallic solution (the electrolyte) and rubbed over the prepared surface. The selected metal is dispursed from the solution and electro-chemically bonded to the item being plated. The thickness of the deposited metal can be accurately controlled.

Brush plating is easily performed using a minimum of equipment. The area to be plated is connected to the power supply with a cathode (negative) lead (an alligator clip); the anode, when applied to the surface, completes circuit. The anode must be kept constantly moving so as not to burn the deposited plate. As the tool must make contact with the surface, many different shaped and sized anodes are available. Concave, convex, flat and round tools are but a few of the options. Each is described by its geometry and its dimensions. The anode is normally made of carbon, and a complete tool would include a handle which readily accepts the DC electrical input from the power supply. Since current is passed through the plating tool, heat is developed. Air cooling fins on the handles are, therefore, provided for the smaller-sized anodes. Solution or water cooling is employed with anodes of large size and shape. The 1/2 inch x 4 inch (diameter by length) cylindrical anode can be considered as an all purpose tool for sculptural usage. Large, flat areas and compound-complex forms can easily be plated with this tool. As long as some contact can be made between the solution soaked cotton batting and the workpiece, plating will occur. The cylindrical anode permits surface contact along its length for plating large areas or at its small diameter circular end for reaching smaller more complex areas. Though the anode must be in contact with the surface, narrow recesses can be plated without much difficulty. Increasing the current, flowing through the electrolyte, will cause a deposit of some metal plate in these hard to reach areas.

Brush plating is accomplished with direct current (DC) and as such a rectifier or power source is needed. Specifically, the rectifier must convert the alternating current (AC) it receives as input into controllable DC. Brush plating does not make use of the high voltages required for bath plating and, hence, a power pack with a DC output of 0-10 amps, 1-25 volts is sufficient for most jobs. Circuit breakers for both the AC and DC current protect the equipment from overloads and the user from short circuits. As various voltages are required for the different solutions, a powerstat permits quick adjustments which are read on a DC voltmeter. A DC ammeter provides information on how rapidly plating is progressing. A polarity switch reverses the direction of the current; forward is used for plating and reverse for etching operations necessary on occasion to prepare a surface to receive the plate. The anode tool is connected to the power pack via a lead with a (banana) plug fit; the cathode lead terminal is a simple clamp. A

digital-ampere-hour meter provides a means of accurately plating to a desired thickness. The excess cost of this attachment can not be justified by the sculptor who generally works by "feel" or by "eye." A 12-volt automobile battery could be used as a power source, but without a means to regulate the output voltage, operation would be limited.

The plating solutions are economical and easy to use. They are packaged in polyethylene containers in gallon and quart sizes (sometimes in liters). All solutions are proprietary with very good shelf lives (generally a year or more). They may be calssified according to the following groupings: preparatory, ferrous and non-ferrous metals, precious metals, alloys, and special purpose solutions. Preparatory solutions are used to degrease and remove oxide films on the surface to be be plated. In many cases etching is required to insure good adhesion for the plated metal. This is accomplished by using etching solutions with *reverse* polarity. Some metals such as chrome, nickel, and stainless steel normally have a "passive" surface. Etching solutions used with *forward* polarity will "activate" these metals in preparation for plating. Stripping solutions can be employed to remove defective electroplates. Ferrous and non-ferrous plating solutions include cadmium, chromium, cobalt, copper, nickel and zinc. Gold, silver, platinum and rhodium are among the precious metal plating solutions. Alloys include nickel-cobalt, brass and nickel-tungsten. Among the special purpose solutions are black-nickel, anodizes, and stainless steel elctropolishes.

Etching solutions using reverse polarity actually remove metal, and hence these can be employed to clean a foundry casting (be it iron, aluminum, brass or bronze) of oxides and other surface impurities. As shall be seen, cleaning, etching, activating and plating operations follow one another with great rapidity. A handle and anode for each solution are almost mandatory as it would be extremely awkward to change covers and clean tools for each operation. As the positive lead from the power pack attaches to the anode handle by a simple slip-fit, the process is simple, clean, and fast. For example, to prepare and plate copper or a copper base alloy such as bronze, the following operations are required:

1. Degrease and clean object to be plated via a suitable solvent, wire brush, etc.
2. Electroclean using solution LDC-01 at 10-15 volt forward polarity until the following rinse water will not "break" on the surface.
3. Rinse with clean tap water.
4. Etch with a No. 3 solution at 10-15 volt reverse current until a uniform and light clean copper colored surface appearance is obtained.
5. Rinse with clean tap water.
6. Plate with any desired solution with the exception of silver or platinum which require preplates.
7. Rinse.

Steps 4 and 5 may be omitted in the interest of simplicity or to reduce preparation costs. Some reduction in plate adhesion, however, will result. Other metal surfaces are prepared similarly employing differing solutions and voltages. Stainless steel and aluminum and its alloys often include a step to "activate" their "passive" surfaces. This is accomplished by using the correct etching solution (No. 3 for aluminum and No. 2 for stainless) at voltages varying from 12-20 volts forward polarity. Cotton batting coverings and anodes employed for etching should not be used again for activating, as contamination will occur. Certain metals require a preplate, generally of nickel, as part of the preparatory steps.

Preparatory and plating solutions are formulated to be as toxic-free as possible. It must be noted that the gold-plating solution contains cyanide and, hence, must be used in a ventilated room.

A high gloss is achieved by polishing the surface prior to plating. Since the plate is seldom built-up to any appreciable thickness, buffing to achieve a polish would possibly remove the deposited metal. Cobalt and nickel look alike when plated; however, nickel will yellow with age while cobalt will retain its brightness. Chrome is somewhat difficult to plate via this process, though possible. Highly polished cobalt visually looks much like chrome.

Many aesthetic results can be obtained by various plating techniques. An abstract-expressionist result is easily achieved by plating with various metals in a painterly way. Hard edges are obtained by simple masking with tape or stencils.

Masking techniques are varied and simple, making use of inexpensive and easily obtainable materials. Masking tape can be used but PVD (electrical) tape is better as it resists the solutions creeping under the tape. Clear lacquer may also be used.

Surfaces to be plated must be electrically conductive. There are various materials on the market which are used to sensitize non-conductors. Many are silver-graphite materials which can be sprayed on the non-conductive surface. These materials tend to be expensive due to their high silver content. One such produce is Electrodag 416 manufactured by Acheson Colloids Company, Port Huron, MI 48060. A good bond between the sensitizing material and substrate is essential.

Though there are several companies in the United States manufacturing and selling brush plating equipment and supplies, one company in particular is more than willing to work with artists and accept "nickel and dime" orders. Mr. John White and Mr. Belden Hutchinson of L.D.C., Inc., 844 Castle Blvd., Akron, OH, are now knowledgeable of the artist's particular needs and offer enthusiastic support.

The following might be considered a starter set for the sculptor. Included are solutions to prepare many base metals and electrolytes of various metals. Model 1025 power pack is recommended (approximately $500). This rectifier has an AC input of 115 volts and a DC output of 0-10 A, 0-25 volts. A Type-S plating tool at $12.50 each is recommended per solution. This unit is complete with a 1/2 inch x 4 inch cylindrical anode and handle. Since the anodes are easily broken, replacements of this S 1/2 anode at $10.00 per dozen should be included in the initial order. Solutions needed to prepare the common metals used in sculpture would include electroclean, No. 2 and No. 3 etching. Nickel, copper, cobalt, gold and silver might be included in a starter set. These can be ordered in quart capacities with the preparatory solutions in the range of ten to fifteen dollars. Copper is approximately thirteen dollars per quart; nickel and cobalt in the twenty to thirty dollar range. The precious metals can be ordered in less than quart quantities with the price of the gold solution fluctuating at about forty-five dollars per pint. Coverage is extensive. A quart of copper plates approximately thirty square feet at a coverage of .0001". A similar amount of the nickel electrolyte at the same plated thickness would cover approximately fifty-five square feet. L.D.C., Inc. offers a substantial discount to artists. This author receives no commission from the company, but is more than willing to answer any questions concerning this technology adapted for sculptural use.

SOLAR ENERGY KILNS

Zeljko Kujundzic
Pennsylvania

There is nothing new under the sun! Legend tells us that Archimedes experimented wtih solar projects, and the Cartagenians burned the Roman ships entering their harbor with the Archimedes mirror in 214 B.C. An Archimedes mirror is constructed of flat reflector strips arranged in a parabolic curve.

Lavoisier, the 18th century French scientist, designed lenses which he filled with white wine, and the St. Gobain Glass Works made them for him. With the solar energy thus generated, he conducted all the experiments in his laboratory. A printer from Paris constructed a solar collector in 1832 which was the power source for a small steam engine that he used to run his presses.

Solar homes utilizing low temperature solar energy now are becoming quite common in the United States. Almost everyone has heard or read about them. But to those of us in the field of ceramics and metal crafts (I like to call them the "fire arts"), it is of far greater importance to utilize solar energy for high intensity solar kilns.

Indeed, if we look again into the past to examine what other people have done in this area, we will realize this. For example, at Odeillo, France, the world's largest solar furnace has been in operation for over twenty years and has been developing over 6,000 degrees F. It has been used to smelt steel, etc., for industry. It is possible (as some recent French and Japanese experiments have shown), to construct a solar furnace with a much smaller, precisely ground reflector around sixty inches in diameter to produce comparatively high temperatures (around 3,000 degrees F.).

Large solar distilleries have been set up in Greece, Chile, Colombia and Australia, some of them decades ago. They have been producing great quantities of drinking water, some as much as 6,000 gallons a day. In fact, the future of solar energy probably lies not so much in the use of "direct" solar energy, but in distilling alcohol on a large scale from surplus corn, grain, and other vegetable matter. Plants convert solar energy into sugars, starches, and cellulose, all of which yield alcohol, methanol or ethanol. Perhaps there is no need to point out that alcohol as a fuel is superior to gasoline.

Each square yard of the earth's surface receives about 1,000 watts of power during sunlight hours. This gives us a fair idea as to how much energy we are wasting daily. To translate this into "power" language, we should know that one horsepower roughly yields about 700 watts. So we receive more than a horsepower per square yard in terms of energy from the sun!

My experiments in solar research are done mainly because of my concern for the environment and to prove that one does not have to have an enormous background of thermophysics in order to construct a practical and compact device that will produce solar energy. It is also obvious that this source of power does not have to be used for ceramics or metallurgy exclusively. I leave it to your imagination to come up with other ideas.

This is a small experimental solar kiln I constructed in the spring of 1972. It was simply made out of plywood with a sliding back running between two one-half inch wooden rails and two wingnut bolts, so that the collected sunlight could be focused precisely. A twelve-inch Fresnel compound lens from an opaque projector was used in the second solar kiln that I built a year later to concentrate the power of the sun into the area

where the kiln is placed. This was made out of a coffee can which was cut to the correct size and with an opening on the top just big enough to allow the light beam to enter. It was carefully lined with Fiberfax, a carborundum product. The edge of the tin, which protrudes about one fourth of an inch, had been ground into a soft K24 brick so that adequate absorption would be provided for the heat that entered to be retained.

I had numerous difficulties at first. Because I had no success in firing ceramic samples to maturity, I was almost ready to discard the whole project. I realized, however, that I had to learn a bit about astronomy and discover the angles at which the sun moves along its daily path at different times of the year. The axis marked on the front of the collector must be aligned to run parallel to the axis of the earth in order to have the sun's rays fall on the collector at 90 degree angles. Otherwise, even a small deviation will decrease the efficiency.

The best results were produced eventually during the longer days in the late spring, and were even better in the summer when the sun was almost directly overhead. Even then, only a short period of the day would be effectively used for producing temperatures that are required to melt low fluxing glazes, such as Cone 04 at 1,940 degrees F. The best time of day, of course, is from about 11:00 a.m. until about 2:00 p.m.

In firing, small pots have to be used. Even though high temperatures can be reached, only a small amount of this heat can be put to practical use. I found that by focusing the lens in such a way that the beam of light enters directly the inside of the small pot, I obtained excellent results. The refractory material keeps absorbing the heat until it reaches maturing point. I initially made pottery three fourths of an inch in diameter. Later, none of them was bigger than one and one half of an inch in diameter. The soft focus at the start heated the objects in the first fifteen to twenty minutes. By focusing more precisely every ten to fifteen minutes and also manually moving the solar collector in order to track the sun, one could complete the firing in about two hours. But keeping up with the 15-degree movement of the sun on its path across the sky per hour, is a demanding task.

An astronomer friend has given me a small motor and information for constructing an automatic tracking device which will eliminate this problem eventually. In Pennsylvania, where I live during a good part of the year, it is of no use to try to experiment on the days when it is cloudy, even to a small degree, for when the kiln is almost hot enough to start fusing the glaze, five to ten minutes, a cloud cover could cause a drop in temperature.

Other factors have to be taken into account. Even on the sunniest day, a small amount of wind, because of its cooling effect, is enough to frustrate the firing project for the day. But under ideal conditions, sheltered from the wind, I was able to produce temperatures close to 2,000 degrees F.

This small prototype kiln has proved its worth. It clearly demonstrated that a larger kiln may be constructed using two or four collector lenses in a battery and yield greater *amounts* of useful heat at higher temperatures.

At Kern Graduate Center at Pennsylvania State University, my solar kiln aroused considerable curiosity and interest. This led to receiving a grant from the Office of Academic Instruction for Commonwealth Campuses. With some private support as well, I was able to spend the summer of 1975 on San Juan Island, off the West Coast, where I undertook to design and construct a larger reflector-type solar kiln, capable of developing temperatures around 3,000 degrees F., and with a greater capacity than I have done heretofore.

I already had a parabolic reflector which was a private donation towards my research project. It consisted of a 62-inch, 240-pound component, cast in bronze, and then polished to 1/4,000 of an inch precision. Since Egyptian times, bronze has been used in manufacturing mirrors of great perfection and beauty.

But in our age, slave labor is not available to keep this mirror polished at all times. I, therefore, thought of combining it with 20th century technology: electroplating the surface with chromium as this would protect the sensitive mirror with a tough, durable permanently reflective surface, like car bumpers which take tremendous punishment. This seemed to work very well.

The building of this furnace had to be done in several stages:

1. A perfect horizontal platform had to be constructed to insure accurate alignments and smooth tracking of the sun.
2. A simple cradle for suspending the collector and with a good amount of maneuverability so that any work and experiments could be conducted without problems.
3. A strong tripod with an adjustable and versatile suspension system for attachment of the firing chamber or for a secondary reflector mirror to reverse the beam and reflect the concentrated light behind the primary collector (through a ten inch center hole).

The use of a secondary reflector was my ultimate goal for the present kiln, in order to make it possible to build a larger firing chamber without obstructing some of the light and thus increase the efficiency of the collector. It all took more time and more parts and adjustment than originally estimated to assemble and refine the mechanics and procedures to a workable system. I was advised by other solar experts to retain the original one pound coffee can as the standard unit for the firing chamber. This would in fact give me a comparative value for measuring the speed and efficiency of this and the previous kilns that I built. I found this to be true. My first test firing proved that this new furnace was vastly superior to the small experimental kiln I used before.

The chamber heated up to 2,000 degrees F. within seconds, and it was possible to raise the temperature to 2,800 degrees F. in five minutes. I was able to soft focus the light beam on my piece of pottery and the firing cycle was completed in just over an hour. Encouraged by this success, I changed the kiln chamber to a two-pound coffee can lined again with Fiberfax and I repeated the process the next day with equally good results.

It took seven minutes, however, to reach maturing temperature and another pot was fired in a little more than an hour.

I changed to a three-pound coffee can on my following experiment and again the temperature rose within seconds to 2,000 degrees F. This kiln was three times the size of the one I used on the first attempt. I had no difficulty, and reached the melting point of the glaze in just fifteen minutes. The pot was fired and matured in an hour and a half.

At this stage, I decided to switch to using the second reflector mirror and move directly into the final stage of the testing intending to use the three-pound capacity kiln chamber as a starting point. I did expect some loss of efficiency through this reversal process, and I was anxious to find out to what degree. Estimated loss of efficiency is approximately three percent. I installed the mirror and made all the necessary adjustments for the subsequent firing.

The sun was unfailing day after day for two months; I seldom saw even the smallest cloud on the horizon. But now it happened—a few clouds appeared suddenly. Soon showers forced me to cover the collector with a tarpaulin that I held in reserve for such

an event.

The sun emerged again a few days later, in all its splendor and brilliance. I was eager to resume the experiment. I lined up everything and let it go. But after a minute or two, it became obvious that this was not going to be satisfactory. The needle on my temperature gauge hardly moved at all. When I decided to check the problem at the source, I suddenly realized that the secondary mirror was smoking. On closer examination, I realized it was melting from the fierce heat!

I immediately swung the cradle around. But it was too late; the mirror was ruined.

I was upset and dumbfounded. What was wrong: Did I install it badly? Step by step, I checked everything. I could not find a logical explanation for this failure. Dismantling the mirror, I decided to examine it with a powerful magnifier. The surface of the glass was melted!

Then it occurred to me that I should have used a highly polished metal surface as a mirror, and not glass. The concentrated light beam, particularly the short waves coming from the primary collector, produce a considerable amount of heat passing through the actual thickness of the glass, since the silvered surface is on the back side.

To find out if this was the reason for the disaster, I decided to cover the curved glass mirror with aluminum foil and test it again. Even though the surfacing of the mirror was wrinkled and imperfect, when I aligned it, it did in fact reflect better this time and the surface did not get too hot, as it did previously when it was just glass.

So this was the problem! Identifying it, however, did not help much, although this brought me piece of mind. The problem remained. I lacked the means to manufacture a new metal mirror with the necessary precision to continue this experiment.

My time had run out. I had to think of dismantling the whole collector, tracking system and all, and packing up to return to Penn State.

Solar energy is the only totally non-polluting, environmentally congruous and free-source of unlimited power. We must learn to harness it or perish.

At no time should one experiment with lenses or reflectors without wearing protection glasses, not just dark glasses, but welder's goggles with at least a No. 3 filter lens. Even for just a few seconds if I had forgotten to put my glasses on while I was adjusting the focus on my solar kiln, I would be seeing spots for the rest of the day. This is obviously harmful, for it is very easy to damage the eye with such a powerful concentration of sunlight. It is also easy to inadvertently burn one's hands and one should wear asbestoes gloves. (It is hard to get used to the idea of the tremendous heat in these small furnaces.) It is also a good idea, in case of an emergency, to have a blind ready, or a piece of cardboard, that can be pulled over the lens to immediately stop the supply of sunlight.

I expect that many potters will be experimenting with solar kilns in the near future, trying their luck with the production of solar pottery. In order to avoid disappointment, the best ceramic material to start with in solar kilns is Egyptian paste with a low fusing point. After achieving success here, work towards the higher temperatures. I have a five-foot reflector lens which I have used for building a larger and more powerful solar kiln on San Juan Island, capable of producing temperatures of around 3,000 degrees F. I think this should produce some very exciting results in future experiments, but I am convinced that a Fresnel lens is probably the most effective and the most practical way to generate high temperatures. Therefore, I am engaged at present in designing a large twenty-five inch lens which will be manufactured in glass by a company in West Virginia.

NOTE

Considerable difficulties were encountered in firing ceramics very rapidly. The excessively fast temperature cycles tend to crack the pots.

I rectified these problems with good results. By developing new clay bodies by mixing additives such as petalite and/or wollastonite in various proportions, I was able to make them withstand the heat shock.

FRESNEL LENS MODEL SOLAR KILN built in 1971

Kujundzic working on the MODEL 4 EXPERIMENTAL SOLAR KILN

MODEL 4 KILN in operation with the two pound firing chamber

LATEX AS A SCULPTURE MEDIUM

Tom Ladousa
Louisiana

INTRODUCTION:

This presentation deals with my findings in the use of 3382 KWIKMOLD and I-P-5 liquid latexes for two years. These are new liquid latexes which the rubber companies have put out principally for making molds. Both products have a heavy viscosity which runs very little when they are applied to a form. They come ready to use, and in use, produce room-temperature curing molds and casts with superior tear resistances. With these rubbers it is possible to produce thin, lightweight sculptures so flexible that they can be turned inside out without cracking or tearing; the finest detail can be picked up. They have the property of great release-ability which provides ejection ease and the elimination of using mold releases. They can be used to coat any type of form no matter how severe undercutting may be. The finished pieces are easily colored and cared for, if kept inside.

RUBBER LATEXES:

The rubber comes in a liquid state which is ready to use. The latex comes in containers which must be kept closed, for the liquid cures at room temperature without the application of heat and pressure. The shelf life of each container is in excess of one year, if kept at room temperature.

BRAND NAMES:

No. 3382 KWIKMOLD is sold by Adhesive Products Corporation in New York, and I-P-5 is sold by General Latex of Ohio. Each of these products provides the same results; my report applies to both. There is a longer order processing time from Adhesive Products Corporation.

ADDRESSES:

Mr. P. C. Astor

Adhesive Products Corporation
1660 Boone Avenue
Bronx, New York 10460

General Latex and Chemical Corporation
P.O. Box 351
Ashland, Ohio 44805

COST:

KWIKMOLD	
5-gallon containers	$4.80/gallon
55-gallon drum	$3.75/gallon
By purchasing 30 gallons Six 5-gallon containers	$4.50/gallon

I-P-5	
5-gallon containers	$4.80
55-gallon drum	$3.75

WEIGHT:

5-gallon containers	40 lbs.
55-gallon drum	450 lbs.

RUBBER SCULPTURE FROM CLAY:

I have found clay to be the best material for making the forms and pieces I wish to rubberize. The reason for this is simply that the coated forms can be broken and the clay dug out easily through a slit made in the rubber. Other methods of making forms will be discussed later on in this report.

First, the form is built with clay and then allowed to dry to a leather hardness. If the form is coated when it is still soft and moist, the coatings would take longer to cure and would remain moist and weak and, therefore, could tear easily. To get the best results, it is very important that each coat of latex be perfectly dry before another coat is applied. Where crevices permit the latex to puddle, it is important to brush them out. The reason is that a dry film will form on top of the puddle, preventing the latex underneath from drying. These undried

areas are weak and tear easily. The use of a fan speeds up drying and cuts in half the waiting time between coats. It is ready for another coat when the color changes from milky white to light tan. This usually takes from three to four hours. You can achieve perfect detail by either brushing, pouring or spraying on the latex. I have found brushing to be the most convenient and efficient way to work. For small upright pieces pouring saves time, but more rubber is wasted because of runoff. I do not recommend spraying, for it takes too long to build up the required thickness.

In brushing on latex, one should break the formation of pinholes usually caused by entrapped air, by blowing against the bubbles. The best brushes are ones with nylon bristles. These are easily cleaned and cared for wtih soapy water. When not in use, they should be kept in water. Other types of brushes are ruined immediately because the rubber coagulates and hardens the bristles.

The latex should be dabbed onto the form and not brushed on as one normally paints a surface. This allows a heavier coat of rubber on the form and cuts down on the number of applications. The thickness of each coating would be comparable to pouring the rubber over the piece and allowing the excess to run into a container below. A durable thickness is obtained by repeating this procedure three or four times. I must mention again that each coat must be dry before the next is applied. When the thickness is about one eighth of an inch, the form can be turned over, trimmed and coated on the bottom to the same thickness.

The form is then dusted with clay dust, baby powder or talc to remove the stickiness. A slit is made in a convenient place, usually at the bottom, and the clay is removed. The form can be reversed by pulling it through the slit to reveal the texture of the first coat or left as is. You now have a collapsed rubber form which can be re-shaped by stuffing with a hard or soft material. When the form is filled out, the slit can be sewn up and a line of rubber beaded over the threaded area. Care must be taken to clean the surface where rubber is attached to rubber to insure a good weld.

COLORING:

A complete range of color can be obtained by using acrylic colors. Avoid the use of oil colors, for they are destructive to natural rubber. The color is prepared by adding liquid latex to prevent it from cracking. Color does not change significantly with varying amounts of acrylics. Thus, a small amount will prepare a large amount of colored rubber. A dime cone-cup full of color easily will coat a form 15 inches high and 15 inches long. A small amount of acrylic is squeezed into the cup and a few drops of water are added and stirred. The cup then can be filled three-fourths full of rubber and stirred again until the color has been mixed thoroughly. Many different effects can be obtained by painting the finished form or by building up thickness with colored rubber, for instance.

PATCHABILITY:

These rubbers will adhere to themselves even after curing; thus, separate pieces can be joined together. The important thing is to clean both surfaces to be joined together. The best way is to moisten the areas with rubber and then rub until the latex dries and rolls off. The edges of both pieces are coated and allowed to dry to its tacky stage and then contacted together. The easier way is to sew the edges together and then coat the threaded area with latex.

AIR-TIGHT RUBBER SCULPTURE:

This is an impractical way of filling out the forms because the rubber is porous, and the sculptures must be watched and blown up once or twice a week. I have found that rubber balloons coated with latex will maintain for seven months an air tightness without loss of pressure.

This process is the same as the clay procedure except that the slit is sewn up and sealed without stuffing. Added to the piece is a prepared valve through which air can be blown into the form. The valves can be made by coating dolls with liquid latex.

The form should be inflated only until the largest part of the form has been filled out, but not stretched. This may be done by mouth or with the help of the enclosed vacuum cleaner attachment. The large end of the attachment slips over the vacuum cleaner hose (changed to "exhaust" from "intake" part of the machine). The small end can then be placed against the inflation tube of the piece.

The plugs should be coated with paraffin to prevent leakage through the valve. Remember, over-inflation will cause leakage to result. The leaks can be found by washing the inflated forms with soapy water and watching for bubbles caused by the escaping air. You can mark these areas with toothpicks and then later add drops of latex to the cleaned areas. Remember, deflate the piece before patching it.

CLEANING THE SCULPTURE:

The finished rubber sculpture can be cleaned by gently washing with soapy water. The form should not be allowed to remain in or on water for any period of time, for it weakens the latex and causes it to rot. Do not become alarmed if the wet latex looks milky becuase it will return to normal color after drying.

VULCANIZING:

The coated form, if small enough, could be cured by putting it into an oven for 40 minutes at 240 degrees F. If this is done, make sure the clay form is thoroughly dry before heating it. The practical way is to boil the collapsed latex forms in boiling water for 40 minutes. This treatment tends to prevent the piece from stretching out of shape and gives it a longer life. The stripped skins also can be heated in an oven for 40 minutes at 240 degrees F., but the smell is irritating and lasting, so prepare adequate ventilation.

The normal aging of these latexes can be improved by adding an additive called Antioxidant 9. This product is put out by General Latex Corporation (of Ohio). The recommended use is one pound to 100 pounds of the latex. You can order this product already prepared by asking for:

I-P-708*
General Latex and Chemical Corporation (of Ohio)
P.O. Box 351
Ashland, Ohio 44805

*Use in place of I-P-5.

CAUSES OF DETERIORATION:

Deterioration occurs with any extended outdoor exposure where the latex cannot withstand the severe ozone attack. The rubber breaks down indoors under ultraviolet light exposure. Also the presence of materials such as copper or manganese will cause rapid deterioration. Care should be taken that there is no contamination caused by using copper or brass parts in equipment used for the application or the application of latex to such metals.

Avoid contact with oil, grease and other petroleum products because they are destructive to rubber, and extended dampness breaks down its resistance. Avoid temperatures above 180 degrees F.

Six years is the expected life span of sculpture made with these latexes.

HEALTH FACTS:

The chemists of Adhesive Products Company report that No. 3382 KWIK-MOLD does not contain solvents which can give off fumes; it does contain a very small percentage of ammonia which acts as a stabilizer.

I feel that caution should be taken

against breathing too much of the vapors. Use with adequate ventilation. Keep the container tightly closed when not in use. When the liquid is exposed to air, a skin will form on the surface; the liquid is no longer usable in coating forms.

FILLERS:

To build up a quick thickness and add texture to the piece, fillers such as saw dust, woodshavings, clay dust, sand, and cork can be used. Ground cork rubber filler can be bought from Adhesive Products Corporation.

4516 Monzini Ground Cork Rubber Filler

5 lbs.	$1.00 per pound
10 lbs.	.75 per pound
25 lbs.	.50 per pound

(minimum order 5 pounds)

The process is to mix the material into the rubber as thick or as thin as you like to work it. Color can be added to the mix and stirred in if desired. When coating with a thick application of filler latex, a longer time should be allowed before another coat is added. I would recommend a 24-hour wait—under a fan if possible.

LOOPS IN REVERSING THE FORM:

If loops are present in the sculpture and you wish to reverse the form by pulling it through the slit, one edge of the loop must be out and reversed with the rest of the form. It can be attached by sewing and rubberizing the threaded area. It is not necessary to add other segments while the other is still tacky. It can be completely cured and still adhere to another piece.

COATING FOUND OBJECTS:

Any form with a polished, hard surface can be coated and removed from the form. The only material, which rubber will not release itself from is fabric with any kind of textured pattern. Care should be taken not to rubberize copper or brass parts, for these metals react against the latex and cause deterioration; this also applies to manganese. Larger slits must be cut in coating-found objects to allow room for pulling the latex skin away from the form.

GENERAL PRECAUTIONS:

1. When working with latexes, wear old clothes as they will be ruined once latex gets on them since it is so hard to remove.
2. When containers are open, have good ventilation and use exhaust fans.
3. Avoid getting latex on head or arms as this results in pulling out the hair the latex has cured on.
4. Latexes will burn and irritate cuts and scratches.
5. If allowed to freeze, latex will spoil.
6. Do not contaminate the resin with other materials.
7. Avoid prolonged contact with latex on hands or arms, for it will irritate the skin. You can rid yourself of it by washing with warm soapy water.
8. Do not smoke or strike matches around opened containers. Latexes are flammable!
9. Where all coats are applied by brush, break air bubbles by blowing on them while brushing.
10. Where crevices permit the latex to puddle, brush these out. If this is not done, a dry film will form on top of the puddle, preventing the latex underneath from drying out.
11. Always dust the form before removing the clay or removing it from a form, to prevent it from sticking together.

CAST IRON FACILITIES

Kenneth G. Ryden
Illinois

Hard work, numerous variables, educated guesses, frustrations, danger, and finger-crossing may not all be necessary in making art, but they are persent in operating a studio-built cupola. Thanks to people such as Julius Schmidt, Steve Daly, and Wayne Potratz, my interest in iron grew to the point that I, too, had to build an iron casting facility. Elden, thank you for the bronze casting experience at The University of Kansas. It was an invaluable preparation for launching this interest. Several months of research with industrial approaches using continuous tapping cupolas with melting rates of up to and over thirty tons of iron an hour, coupled with information gained from the above mentioned sculptors, aided me in designing a complete and permanent iron casting facility at Southern Illinois University at Edwardsville.

Several graduate sculpture students and a couple advanced undergraduate students helped finalize the designs and construct the facilities. The actual construction of the complete facility took two solid months with many all-night sessions. I am happy to say, however, that we have a full-fledged iron program at S.I.U.E. The facility works well, not thirty tons per hour well, but all the iron we care to handle an hour.

The interest indicated by students and other artists prompted me to build a demonstrator facility, one that is portable and easy to operate. This allows me to easily break in new casting crews and conduct workshops at places other than Edwardsville. Although this facility is small, it works amazingly well and may be a size that others would like to build to break into the process. I am including the plans in this report; use at your own risk, of course. I am sorry, but I can not guarantee you won't have problems; cupolas that look alike do not necessarily work alike. If you decide to venture into casting iron this way, please put safety concerns above all else. Serious injury can result from short cuts.

A cupola is a stack-type furnace fueled with coke and supercharged with forced air. The metal charge and

ASSEMBLY: CUPOLA

additives are layered in between the the fuel charges. Air enters the melting zone from a wind box through regularly placed openings around the lower mid-section. These openings are called *tuyeres*. After a carefully proportioned bed of coke is properly ignited, the charges are added through the top or stack section of the furnace. The molten metal collects at the bottom or well section. The metal is tapped out

through a hole at the bottom front of the well; the slag runs off through a hole at the upper rear of the well. The tap hole is plugged with a clay and wood floor plug (bott) until the well is filled. This is an intermittent tap-rear-slagging cupola. The slag hole is left open. A full well is indicated when metal begins to run out the slag hole with the slag.

The metal is tapped out by breaking the bott with a pick or a heavy hammer and a chisel. (Care must be taken so as not to damage the tap hole itself.) The tap-out hole should be shaped in the form of a truncated cone with the larger section facing out to facilitate removal of the bott. The metal is tapped into a pre-heated refractory-lined steel bucket-type ladle and carried in a shank to awaiting molds and poured. The tap-out hole is plugged and the process continues. The molds that seem to work best are chemical bond sand, CO_2 sand, and ceramic shell, although green sand works well if you are able to handle it.

The most common fuel seems to be low sulphur by-product coke, although some foundries use beehive coke. Anthracite and charcoal were used in the past. If obtainable, a sturdy low-sulphur, low-carbon pick up, high-heat coke should be used. We are fortunate to have access to a large supplier in St. Louis. The size of the coke should be approximately one-eighth to one-twelfth, the diameter of the melt zone. We often have to break it into small pieces after we purchase it, because it is sized for large industrial furnaces.

The metal charge we use is primarily scrap iron, things such as radiators, bath tubs, sinks, cast iron pipe, manifolds and the like. It is broken into small pieces no larger than one-third the diameter of the melt zone. Industry adds pig iron and steel to the charge; we sometimes add steel. Numerous alloying elements are used to modify characteristics of the iron. We most often add one to two-percent ferro-silicon, and one to two-percent manganese; this, for our purposes, is usually satisfactory, although I often experiment with other additives.

It is necessary to add a fluxing agent to lower the fusion point and improve the fluidity of the slag. A high-grade limestone (containing less than two percent silica) seems to be the most popular, although calcite, oyster shells, and dolomite works well also. The flux is added at a proportion of from less than one to seven-percent of the metal charge. Small amounts of fluorospar or soda ash are often helpful as supplementary fluxes if, for example, the iron is excessively dirty or rusty.

SLAGGING OPERATION

The color of the slag should be closely watched as it indicates the efficiency of the melting process. Light colored slag indicates an excess of flux and possibly coke; a black slag indicates the danger of excessive oxidizing conditions because of poor fluxing or a deficiency of coke. A slag that is dark green in color indicates normal operating conditions.

The ratio of fuel weight to iron affects the speed and efficiency of the melting process. Industrial formulas vary from 1:6 to 1:12. However, we often use a ratio as low as 1:5. The fuel, additives, and iron charges are pre-weighed and carefully layered in the furnace in that order. A bed of coke is first ignited and established at a proper height to maintain efficient combustion before successive fuel, additive, and metal charges are added. In theory the bed height should be regulated so that all the oxygen supplied in the blast is consumed just as it reaches the top of the bed. The weight of the coke charges should be adjusted so that the bed height is maintained throughout the heat.

The coke bed is ignited by building a kindling fire of oil-soaked wood in the well of the furnace. Oil-soaked coke is layered over the kindling. Air is temporarily supplied through the tap hole and later the slag hole as well. Be careful that heat does not backtrack through the windbox to the blower and damage it. When the kindling has evenly ignited the oil-soaked coke to a level just above the tuyere openings of the melt zone, air is supplied through the windbox. A lid can be temporarily placed above the stack to aid in burning in the bed evenly. The proper bed height for the cupola illustrated, normally, is at a level just above the top edge of the windbox. Improper burning of the bed can lead to failure later in the melting process. Drops of metal should be seen through the tuyeres within a few minutes after the first metal charge is added. The tap hole should be left open until a sufficient amount of molten metal has run through to superheat both it and the well to help prevent a metal freeze-up at the bottom of the well.

The bottom of the cupola is a sturdy steel trap door. The floor of the well is a mixture of green sand and vermiculite slanted toward the bottom of the tap-out hole and heeled around the edge of the refractory wall. A minimum depth of three inches is recommended for a small cupola. Large cupolas usually have holes in the trap door to help gases escape from the well.

Shut-down of the cupola should be conducted carefully, and the proper time should be anticipated in advance. Dry sand should be shoveled under the trap door to catch the drop. One last tap should be made to drain the well. The air supply should be shut off, and one tuyere cover should be removed to prevent coal gas from collecting in the windbox. The trap door should be immediately dropped. It may then be necessary to ram a long, heavy rod down through the stack to help clean out the inside of the cupola.

The cupola must be carefully repaired before using it again. The tuyere, tap-out, and slag openings must be cleaned out and repaired if necessary. The slag and loose castable must be chipped off any areas of the castable that are eroded or deteriorated; more castable must be built up over those areas. Ladle wash should be painted over the patched areas, and the new castable should be heat-cured before reusing the furnace. The furnace should be constructed in sections to facilitate making repairs.

The castable used should be of superior quality. It should withstand high heat and abrasion and have excellent spalling resistance. If bricks are not used, super-duty fire clay, super-castable, or plastic castable can be used. I personally prefer a Kaiser Mono T 9 air-set or heat-set plastic refractory. It is used in industry for setting bricks around tuyeres and slag or tap-holes and for minor repairs. This works well for the ladles, too. The castable should be firmly rammed into the cupola with the temporary aid of a reinforced inner form to keep it in place until it is set. Curing should be slow and careful. The castable should be cured to approximately 2400 degrees F. Small (weep) holes should be drilled in the outer shell to allow moisture to escape during curing. These should be added before ramming the

castable. They will also help lock the castable in place. The inside of the furnace and ladle should be washed with ladle wash.

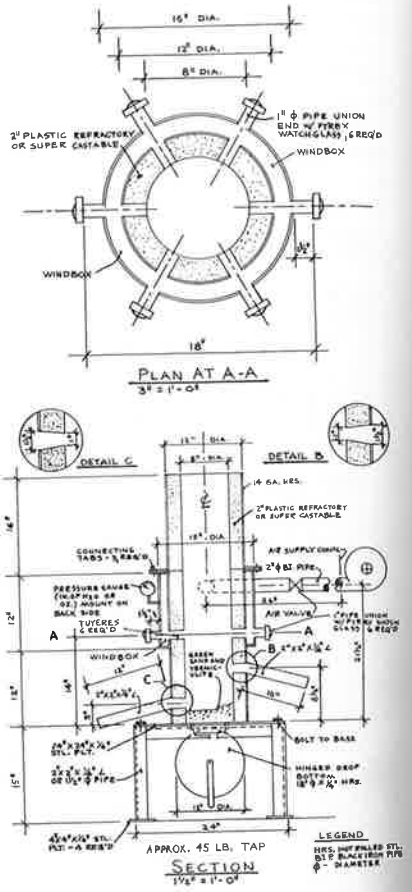
The tuyere openings should be large enough and carefully placed so as to distribute evenly the air supply in the melt zone. Poorly designed tuyeres may cause hot spots or cold spots which may cause a bridging effect across the top of the melt zone. The tuyere covers on the cupola illustrated are plumbing unions with pyrex watch glasses used for lenses. It is important to keep the tuyeres open. When slag blocks a tuyere opening, the cover is removed, and a rod is used to push away the blockage.

The blower for the cupola should be almost equal to that of a comparable melt size blast furnace. The tap-out should relate to a similar sized crucible blast furnace. A blower from a number 20 crucible furnace should be ample for the demonstrator cupola illustrated. It should be able to maintain at least an air pressure of seven inches of water in the windbox during normal operating conditions. I use a strong vacuum cleaner blower on the cupola and an industrial blower on the larger cupola. I believe that moves about six hundred and thirty cubic feet of air per minute and can maintain about eleven inches of water pressure in the windbox.

The melting rate of the cupola can be regulated by the coke to air ratio. Slower melting can be achieved by using more coke or less air; faster melting can be achieved by using less coke or more air.

Ample safety equipment is a must. For example, face shields, safety glasses, foundry gloves, coats and aprons, hard hats, leggings and work boots will help protect, but minor burns still occur to people working around the cupola or pouring molds. Invariably, hot cinders coming from the stack, open tuyere, or slag hole, or splashes of metal from tapping, botting or pouring find a way to reach skin. Therefore, a first aid kit should be available. Make sure a telephone is handy to summon emergency help should the need arise.

DEMONSTRATOR CUPOLA, DESIGNED BY KEN RYDEN
SECTION THRU WINDBOX AT TUYERES



DEMONSTRATOR CUPOLA
Kenneth G. Ryden

I believe this summarizes the process. I will be happy to answer questions through the National Sculpture Center or you may write directly to me. Good luck, and VIVA IRON !

MOLD MAKING MATERIALS

I. No-Bake Molding, Ashland Chemical Co., Columbus, Ohio.

a. Bond Oil — Linocure A 55 Mixed at ratio of one to two percent of weight of sand.
b. Catalyst — Linocure Part C Mixed at ratio of 20 percent of weight of Bond Oil.

II. Ceramic Shell — Nalco Chemical, Chicago, Illinois.

a. Nalcoag 1030
b. Nalcast P1W
c. Nalcast S2

1. Slurry consists of 3 parts 1030 to 7 parts P1W.
2. Stucco S2 over coating of wet slurry.

III. Core Paste, Mold Wash, Sand for No-Bake. Midvale Mining and Manufacturing Co., St. Louis, Missouri.

a. Banding Sand
b. Dura-therm 56 Zurcon Graphite Refractory Mold Wash.
c. Liquagrip Core Paste (premixed).

IV. Charge Formula

25 lb. Cast Iron Scrap
5 lb. Coke
4 oz. Limestone
3 oz. Ferro Silicon

V. Cupola Information

a. Details — refer to attached drawings.
b. Overall dimensions

1. Height with base 55"
2. Outside diameter 12"
3. Inside diameter 8"
4. Depth of well 5½"
5. Maximum capacity of well approximately 45 lbs.

A CASTING

(*Pastoral Symphony Number II*, by Saul Baizerman)

Herk Van Tongeren
California

Saul Baizerman's *Pastoral Symphony Number II*, a 8 x 10 foot plaster relief, was purchased from the Baizerman estate in 1969 and given by the Carl O. Jeffress family of Greensboro to the University of North Carpenter, former chairman, was responsible for the procurement of this monumental work and for its casting, which was undertaken in the Art Department's foundry at the University. The project was undertaken by Paul Kubic with graduate assistants Clifton Prokop and Dennis Evans. They initiated it as a sand-piece mold, but due to a misrun, they changed to a wax meltout. Because of extenuating circumstances, I took over the teaching position and continued the project. Cliff Prokop, Marvin Tadlock and Bill Keen assisted me throughout the molding and casting of the remaining panels.

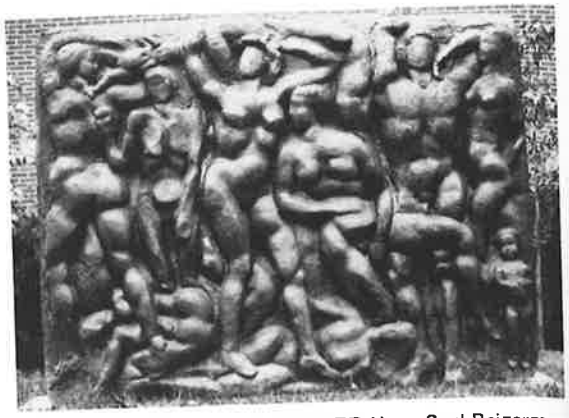
Using Baker Bond Oil-W 10 from Wolverine Foundry Supply, this wax meltout sand process (as developed by Julius Schmidt) is described very well in Stephen Daley's article in the *Proceedings of the Fifth National Sculpture Conference, 1968.*

The technical problems, such as gating, were refined by Cliff and me as we continued working on the half-panel waxes measuring four feet by three and one-half feet wide. We improved our gating in an attempt to cut down on the burn-in. The best panel was done by using a one and one-fourth inch main sprue which dropped down the center and was connected to a sump which was two and a half times the size of the main sprue (the panels were then poured on edge). This caused the metal to slow down in the process of filling. Off of the sump, we ran a runner up each side of the main sprue, gating off all three as we went up the piece. These runners then re-entered the work six inches from the top. We used a series of vents along the top edge, each with a substantial shrinker added. (Larger vents are required with wax meltout because most of the wax percolates into the sand, causing much of the gas to burn off.) Using larger vents, I have experienced no problems with gas affecting the metal. I use square vents and gates to slow the metal down, choking them down where they touch the wax "art" to eliminate shrinkage around the gates. In venting detailed waxes, there seems to be a fine line between back pressure from choking vents, and increasing detail and properly venting to avoid chilling of the metal.

GATING

Each sand mold for the Baizerman ended up being six feet high, three feet thick, and five feet wide. We used much internal steel rebar with gagers dropping down into the gating system. This gave us something to weld the outside channel iron onto, in order to hold the two mold halves together. Because of the design of the mold, we rammed the wax right into the rubber and plaster mother mold. This meant ramming the cup and vents as a separate cap. We used

SAND MOLD



PASTORAL SYMPHONY NUMBER II Saul Baizerman

graphite suspended in alcohol as a face-coating. The mold was placed on the kiln floor which had two home-made, long venturi burners under it. The kiln, made of Mono block insulation, was placed over the mold with the bridge crane. Because it would be unrealistic to flip the mold, we ran wax drains from the sump to the outside of the mold. These were plugged with sand plugs and high-temperature refractory cement before pouring. The kiln time averaged 30 hours for each mold as a result of the temperature in the foundry which was quite cold at night. We brought the kiln up to 350 degrees, but not more than 400 degrees. The molds were rammed in a pit and poured with a number 325 crucible using a two-ton electric bridge crane.

In the end, as it turned out, the welding and chasing were the real problems. When Baizerman joined the plaster panels, there were large gaps which he filled with more plaster. In the process of moving the plaster from New York, it had to be unbolted, which consequently left large open spaces which later had to be filled with separate cast pieces applied to two eight-foot seams. Because the gallery doors, leading to an enclosed courtyard where the piece was to be installed, were smaller than the casting, we had to work out a bolting system for the panels inside the foundry while we still had the use of the bridge crane. Also, the size of the panels along with the alloy (regular tombasil) presented welding problems. The welds cracked when we used the Tig, and we were afraid of serious preheating because of warpage. We finally resorted to using the Arc welder: DC with electric bronze rod. The trick is to weld an inch at a time and then peen it with a hammer. This relieves the stress, and stops the weld from cracking. With the same rod, we welded steel clips to the back of the sculpture to tie into the I beams which were cemented into the ground at the placement site. We finished the piece with a ferric nitrate patina.

During the welding, chasing, and patina work, I was aided primarily by Mark Heffelfinger, John Wofford, and Bill Keen. The students worked long hours and we all learned a great deal during the project. The Baizerman was completed in the spring of 1973.

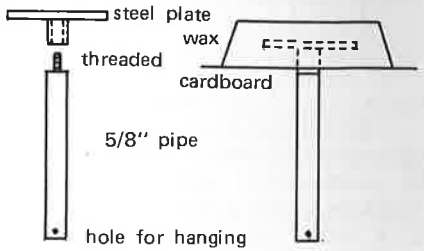
CERAMIC SHELL TECHNIQUES

Herk Van Tongeren
California

In the several years and various locations where I have worked with ceramic shell, my finest experience was a 15-month stint with a commercial art foundry as assistant plant manager. With ethyl silicate, a large autoclave for dewaxing and a table-type induction furnace, we poured 20 to 40 shells daily, the largest holding 75 pounds of bronze. The greatest asset of working in this facility was the sheer volume of daily problems to be resolved from one end of the process to the other. Thus, now when I am working with a cheap "instant" foundry, I find I can anticipate some of the persistent problems. Hopefully, I can pass on to you some of the knowledge I have gleaned from my experiences.

Starting with a good wax is essential. It is difficult to give an exact description of how to pour a good wax, as all molds are different. For my own molds I use Black Tufy and paint the wax on. After a few coats, I add fiberglass mat (pull apart type) for strength. I then pour square troughs of tufy, which I cut into cubes and set into the last coat. This method thoroughly keys the rubber into the plaster backup mold. I then use spray silicon for a mold release. I heat Victory Brown wax to about 195 to 205 degrees F. (using a candy thermometer), depending on how thick or thin the mold sections might be. On a very thin piece, I heat the tufy in an oven to cut down on surface chill. Then holding the mold almost horizontal, I slowly pour the wax, lowering the angle of the mold, accordingly. When the mold is full, I slowly pour the wax out, turning the mold and again lowering the angle gradually. I wait approximately ten to twenty minutes and repeat this process, using a cooler wax (one just starting to "skim" over). I use a harder wax for the third coat so that later distortion or sagging is at a minimum. In each of the above steps, I pour the wax out slowly immediately after filling the mold. If the mold has a large pouring area, as with a portrait head, I take a brush and drip wax onto all the projections and areas that did not coat well after the first coat. With painted waxes, I use different colored waxes so that I can tell where I have coated. You can color a wax by tossing a crayon into the pot. The inside of a casting. Otherwise, as the metal flows, it can break off pieces of the investment material, and they will surface in the metal.

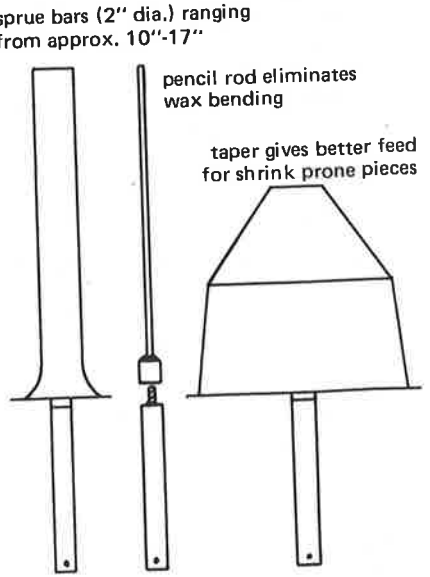
Next, one has to decide how to gate the wax and how to handle a core, if there is one. I use a number of industrial techniques. The primary one is in the use of threaded handles and plugs. (No. 1) With this method, you do not have to handle the piece during much of the gating or while coating it with shell. I use a pin-type ball vise, set up so I can slip the handle over it and adjust the angle. Because



NO. 1 Herk van Tongeren

shell is a self-venting system, a minimum of gating is required. I generally put on just enough gates to hold a piece on the cup or sprue bar. Occasionally, I will add a support gate, if something is sticking out that looks like it might break—toothpicks work well here—while dipping it in the slurry or stucco in fluidized beds. I

try also to gate and cut plugs into the easiest areas to chase. I cut very large plugs, and sometimes, even remove whole sections of the back on small figures because large plugs permit adequate core drying. It is important to close off tricky, narrow cores, legs and arms, or even the head on small figures. In many cases, the only hollow area will be the main body. In such a case, it is better to gate on a sprue bar. (No. 2) The large bar will take care of shrink resulting from the



NO. 2 Herk van Tongeren

varying wax thickness. The piece should be positioned in such a way as to facilitate building the core. If there is a heavy section against a thin detailed section, it can be sprued on a bar and the heavy section opened to allow air to be blown into it for chilling when the bronze is poured into the shell. To do this, I use a regular air line from a compressor. If you can chill it, the rest of the piece will draw metal from the bar; not internally. Another advantage of the sprue bar is the ability to "tree up" a number of pieces at once. They are very good also for small, detailed pieces (rings, bracelets), and thin pieces, by virtue of the driving head of metal which forces detail.

One must sprue carefully when using handles on cups so that the piece does not fall off. I use sticktite wax (Yates Manufacturing Co., 1615 W. 15th St., Chicago, IL 60608), to join gates to pieces and cups. I use also their ready-made sprues, as they are harder and do not flex as do some homemade ones. I quickly warm each area to be sprued with a 25-watt soldering iron, then dip the sprue in sticky wax and weld it with the soldering iron. After letting the joint cool for a while, I build up wax around it and weld it again. When the whole piece is gated, I let it cool.

In reference to cutting waxes, if you are working with detailed pieces, let your cut jag in different directions. This makes it easier to hide when chasing. A straight cut is always more obvious, as it stands out more. Then too, erratic cuts are a stronger joint when welding large pieces. At this point I etch (clean) the wax by dipping it in chlorethane and alcohol, a mixture of equal proportions. I then rinse it in plain alcohol. Some of the harder green waxes require a stronger etch mixture, and the softer waxes, a weaker mixture. This etching removes all the mold releases and permits a better first coating.

I have found that *it is very important to let the wax achieve room temperature* before beginning the coats. The alcohol quick-cools the surface, so that, if it is first-coated immediately, it will slowly regain room temperature, causing hairline cracks.

A point I wish to stress in regards to ceramic shell casting, is the importance of experimenting with different products. Naturally, each company emphasizes the importance of the compatability of its products. My use of a number of products is, with a few exceptions, based upon price. On a detailed piece I use zircon sand for a first coat, as it is very dense and very fine. Although it is very expensive, it goes a long way; only the actual piece, not the cup and sprues, need coating. For small batches of ceramic shell, I use: 8.7 lbs. (binder), colloidal silica to 21.3 lbs. flour to a few drops of wetting agent. For a first-coat slurry, I substitute milled zircon (325 mesh), for 50 percent of the flour requirement. This gives the castings a smooth surface which is very good for iron and stainless steel also. It is important to mix the slurry for about an hour before dipping. A good commercial blend of flour is Marketeers Shellvest Powder No. 50, (Marketeers Inc., 19001 Villaview Rd., Cleveland, OH). They will give you formulas for waterbase and ethyl silicate, and they have a wide range of good products.

Viscosity for a primary slurry is 35 to 50 seconds with a No. 5 Zahn cup. Being a thicker slurry than the backup slurry, it affords one the time to brush or blow all the air bubbles out of a detailed piece before stuccoing. I also use some of the suspension agents (alginates) on small batches, especially during workshops where no mechanical mixers are available. However, I prefer using large dipping tanks with mechanical mixers when possible, as it is easier for students and because the viscosity remains a constant if adjustment is maintained. With water base shell, I mark a stick at night and add colloidal silica up to that level in the morning. Being very dense, zircon is not subject to wetting by metal, true also for iron and stainless steel. If the piece has much detail, I will use two backup coats of whatever most companies are using for a first coat such as Nalcast S-1, or Ranco-Sil A or Ranco-Sil "AG" (which is designed to gel the previously applied coating). It is much easier to chase a complicated piece if you build the particle size slowly, for example: zircon, then two coats of S-1, etc. If you fill a complicated or narrow undercut too fast, the bronze will leak into it. One can then finish the shell by stuccoing with Nalcast S-2, Ranco-Sil B or BG, or Calano 22 (Harbison Walker, Dresser Industries). In that these are all fused silica and are compatible, I usually shop for price on them. After the first coats, you are building for strength, essentially. I also wet with collodial silica after the second coat and between succeeding coats unless humidity is high. If I have on original wax, I will often overcoat to be very safe. In my experience, it does not affect the venting characteristics. I have put up to 17 coats on a wax using ethyl silicate, and cast it without problem.

I feel that many problems with shell occur from not heating them enough for pouring. As I pull shells from the kiln at about 1,800 degrees F., they will appear almost transparent. I have heated shells up to 2,300 degrees F. for four hours to burn materials out, let them cool, and then rinse them out with water and re-fire them to 1,800 degrees F. with no problems. Sometimes I will let a shell cool a little before I pour, as in a shrink-prone piece or with aluminum, but I am generally ready to pour immediately. I make a practice of letting all my shells cool after burning out, and then I check them with water. If you fill the shell swiftly, cracks will show right away, and any loose ceramic or burned-out residue will be rinsed out also. I patch shells with high-temperature refractory cement, as it cures very fast with heat and is strong.

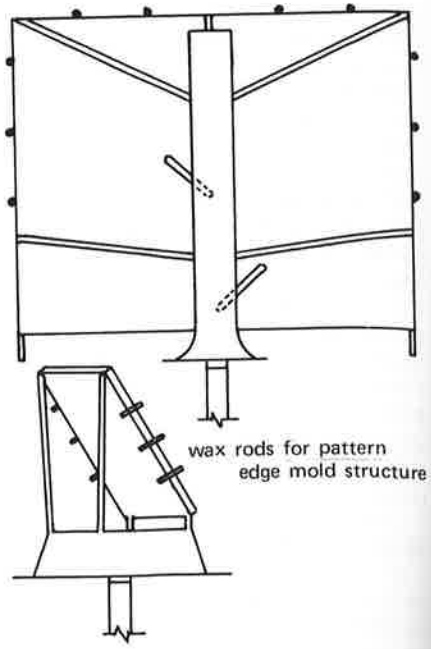
With certain shells, I drill 1/16 inch holes into them before firing. Because of wax expansion, the shell might crack before it cures. With large sprue bars, I drill a hole in the top. This acts as a release valve and takes only a few seconds to patch. When using an autoclave, though an expensive means, all this becomes unneccesary however. A good burnout technique is to place the shell in a kiln that has been pre-heated to 1,800 degrees F. for a period long enough to start the wax flowing, then transfer it to a kiln pre-heated to about 300 degrees F. By using this technique, the wax can be easily reclaimed. I prefer using a kiln

with rolling or hinged door, making it possible to place shells in and out with a long forked steel rod. One of the advantages of using large cups is that they sit flat in the kiln, eliminating tipping. Also, you have a large metal supply for feeding a piece if it has a heavy section. If it is uniform in thickness, you need not fill past the top of the sprues or gates.

I use a number of pouring and gating techniques to minimize shrink. If I fill a cup in order to have a large source of metal for the piece to draw from, I also sprinkle "hot top" on top of the metal immediately after pouring. (Foseco Inc., 20200 Sheldon Rd., Cleveland, OH, Feedol No.9.) This forms an oxide "skin" that keeps the metal fluid, allowing the piece to cool first and thus draw from the still fluid reservoir. Because the shell is partially buried, it is insulated and the cup is in the air chilling. I have observed perfectly cast cups and gates, and the piece has acted as a shrinker—a reverse feeding system. In many cases it helps to choke the gate down a little where it joins the piece. Reliefs are often a problem, because the edges tend to be a weak area. If pieces of wax rod, 1/16 to 1/18 inch round and about one inch long, are stuck along the edge every few inches perpendicular to the piece (No.3) they create a structure instead of a long, narrow plane. Putting gates into the corners also will help. Another method is to wrap some mild steel wire around the relief after the fifth or sixth coat, then continue coating over it. This will help during the initial force of the metal. I rarely reinforce with fiberglass.

Another problem with reliefs is that when they are flat and smooth, the shell tends to lift off. If you cut out a few holes in different places, it gives the shell a place to hold on to. After dipping, I stucco the edges and any projections first, as they are prone to drying right away.

If a piece must be cut up for casting, I always cut with the eventual chasing in mind. With a base-mounted



NO. 3 Herk van Tongeren

figure or animal, I cut at the mid-calve as it is easier to weld and chase. Thus, the feet are cast on the base guaranteeing alignment later.

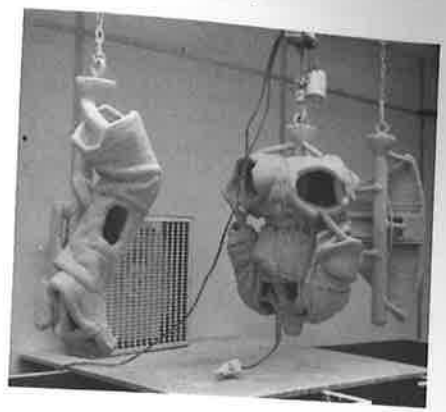
My preference is to pour Everdur bronze with the approximate composition of: 95 percent copper; 3.75 percent silicon; 1.25 percent manganese, and trace metals. Everdur weld rod is easy to purchase; you will find an excellent color match. A low-grade silver solder can be used as well, and if liver of sulphur is applied before other chemicals, it all colors out very well.

I should like to turn to ethyl silicate ceramic shell. Having used it extensively, I prefer it over water base, though it really is a more complicated process. Because it is alcohol based, it evaporates quickly and is less stable. When using this, it is more difficult to maintain the slurry; a temperature controlled room is essential. If one is dipping many pieces, isoproponol anhydrous alcohol has to be added each morning and evening, and a binder added during mid-day. It is advantageous in that it can be jelled almost instantly with ammonia gas. I once went from wax to bronze on an eight-inch piece in two and one-half hours. Wetting agents are not required in the slurry nor is priming with binder between coats. Cores can be jelled very fast. The required information on ethyl silicate can be obtained from either Marketeers or Ransom and Randolph Co., Chestnut and Superior Streets, Toledo, OH 43601 or 2337 Yates Ave., Los Angeles, CA 90022.

The best method I have found for removing ceramic shell is by blasting with glass beads—a mixture of No. 5 and No. 12. In the impossible areas, I put on a little shoe polish after I patina, and then I put some flame on it to melt it in. It will color shell where chemicals will not.

If there are any points about which you need more information, you may write me at the Johnson Atelier Technical Institute of Sculpture, 743 Alexander Road, Princeton, New Jersey 08540.

I am currently working on some pre-coring techniques and ways to vacuum form molds for pouring and painting waxes, instead of always using rubber and/or plaster.



SHELL MOLDS

SHELL APPLICATION

BURNOUT

SKY SCULPTURE

Howard Woody
South Carolina

Contemporary sculptural concepts give a greater significance to space. Sky sculpture is consistent with these trends as it defines a select volume of aerial space. The principal environmental concepts (1) relate to the air structure of this spatial volume and how that is energized by the atmospheric forces. Like other sources of energy, these forces have sculptural potential and can be used for artistic visual organization. *Atmospheric Sky Sculpture* is concerned with using this energy to activate a sculptural sensor, which is presented in this spatial environment and employs a concept of geograhic dispersion.

The vast space in the near-earth sky environment is a major consideration of this setting. This suggests an open spatial sensor, which can visualize the energy in a cubic volume of positive space during a particular period of time. The natural forces which activate or modify the sensor are wind, gravity, pressure, temperature and humidity. The goal is for the sculptural components to respond to this energy and not to over ride it. Therefore, a system, design or material that is too rigid to permit its subordination to the ambient forces is inappropriate. This suggests that a lighter-than-air construction supported in an unrestricted free-floating suspension has the best opportunity to define this gaseous sky environment. The significance of the information transmitted to the viewer relates to how the sensor visualizes the invisible energy and the quality of motion and form as it reflects nature.

My research into sculptures using atmospheric forces in near-earth or sky settings has turned up very few comparable examples. Since this paper needs to be brief, I will not detail these but will simply outline their general catagories. Several environmental works used open spaces between elements in the landscape; used open-air settings as positions for low floating constructions; or used the sky as a neutral background for various presentations. These sculptural forms were usually tethered to the ground, flown like a kite, or they employed some external restraints or controls to direct, pull or contain the unit. When using the near-earth sky, some artists elected to override the natural forces by creating a rigid object (e.g., airplane-type construction); others decided to almost ignore these forces by using such non-physical structures as light or laser beams, while a few chose to construct forms that employed these natural forces. *Atmospheric Sky Sculptures* would relate to the last group, as elements were fashioned to co-exist with the aerial environment. These sensors were then injected into the upper level of near-earth space, yet positioned low enough to be visible.

My sky sculpture sensors usually begin with the developing of a motion response system. Using the features of that system, an expendable sensor is fashioned. The sensor is temporarily rooted to the ground and is related to kites, mobiles and other air devices in its introductory tethered phase, only to change its character in the succeeding one. The ensuing free-flight cycle liberates the spatial organization from the stability of earth and allows it to move without restraint as it carves near-earth space. This flight format is *Atmospheric Sky Sculpture's* unique feature. The transient flight is the sculpture, in contrast to the idea of the physical components being that (2). The sensor's components are shaped to be neutral sensors without irrelevant narrative overtones. Each event uses a selected and limited time span, which has its impelling energy

from a totally different atmospheric air structure, thus, a distinct flight on each occasion.

A clear day with high visibility is selected for a flight. As the sensor ascends through the successive streams of air, it may be directed into altered trajectories by changing wind flows. The sensor can also respond to the surface it drifts over, which can form up and down drafts. During the descent into the lower air structure, the sensor relates more directly to the changing surface features. Hardtop areas such as parking lots, roadways, roof tops, etc, reflect the sun's heat and form updrafts. Should a sensor drift towards such an area, it would pass over until it reaches the complementary downdraft over a cooler surface and land there. This creates a desirable safety feature. All documented landings have occurred on or over a natural surface. Most sensors have been found, recovered, documented and the flight charted to conclude its cycle.

The organizational system is designed to co-exist with the environment. The systems delineate the general characteristics of a related group of different sculptural sensors (3). They may demarcate the external definitions of the sculptural form of conversely, render the interior space. They also may utilize open or closed arrangements, elongated linear or clustered elements, singular or multi-modular designs. The sensors are designed for (1) organized response using a (2) planned flight balance, which is integrated into (3) the wind and (4) ambient atmospheric forces and pressures.

The sensor is designed with a particular linkage to transfer motion between the individual sections. The physical configuration is artistically unassuming and visually uncomplicated in order to subordinate its importance to the more significant flight activity. This is defined through motion, time, light and sound. The flight balance consists of a planned relationship between the lesser density of the enclosed helium and the displaced volume of the denser air. The difference must be great enough to compensate for the inherent weight of the physical components and expectant wind-drag factors and to permit a steady ascent. The wind most directly shapes the visual definitions of the flight. The temperature, pressure and humidity forces act as a modifing factor to the lift potential of the components. They cause the expansion of the contained helium; the rupturing of the envelopes and limit the altitude of the flight. These flights have been presented in all seasons, but the most satisfactory weather conditions would have ground winds of less than 15 m.p.h. on days favorable to open-air activities.

Numerous open-air settings have been used my museums, on university campuses or in parks; however, another consideration is to take these events out to the public in the everyday world with presentations in living, working and shopping areas such as the city plaza, Strasbourg, France; and public housing setting, Sheffield, England.

Other safety and environmental considerations also must be integrated into these sculptures. U.S.A. Federal Aviation Administration regulations No. 101.31-.39, must be observed during the designing of the sensor, selection of the site, planning of the launch procedures and monitoring of the trajectory. The use of these regulations should eliminate the possibility of flying hazards as well as inform pilots of the sensor's presence and identity. An environmental concern about the potential cluttering ents is also present, so procedures have been developed to remove these from the landing site.

Six major systems have been developed with each containing several different sculptural sensors. For the sake of brevity I will only introduce these. Externally Defined System was one of the initial systems and was developed in the late 1960s. *Space Tower* used a twine and balloon demarcation to define a central spatial core. Balloons were also used in several Linear Systems with *Sky Line* being one sensor in this grouping. This 200-foot calligraphic unit moved through various arrays as it ascended to a probable 18,000-foot altitude for a potential trip of 400 miles as recorded in Europe. The in-air time has varied from 3½ to 17 hours. The initial flight at this Conference will use this configuration. (Description of Conference flights included in Environmental Workshop section.) Other type sensors, such as smoke devices, have also been used in the Linear Systems suggesting some of the potential of these sensors.

Several systems were developed during a 1973 research period and employed mylar film for the elements. *Sky Raft* in the Single Planar System, used a continuous envelope to circumscribe the wind trapping element. In the Continuous Planar System the 10 feet by 65 feet *Sky Carpet* used an elongated series of panels and envelopes. *Sky Rungs* altered this format and substituted an open spatial one between the envelopes. *Sky Cross* used a different motion organization, the Multi-Planar System. The four panels could catch varying breezes and transfer the aerial energy diagonally to adjoining elements.

Since the major sky sensor to be presented at this Conference is *Space Barricade* in the Internal Hanging System, let me describe this sensor in more detail and briefly outline the procedures and considerations used in the sky sculpture concept (4). This configuration uses broad panels, made out of sheer plastic film, as pliant hanging surfaces to divide the virtual volume into spatial segments. The spaced-out sections organize the volume and transfer the motion by the spacing line to the succeeding parts. This sensor uses a floating balance that employs the smallest possible lifting device to hoist the largest compatible space-rendering elements, made from the most diaphanous materials for a slow, pliant flight cycle. The sky rendering materials have a limited life span. In fact, most components are used only once before being damaged by flight conditions.

The prototypes of this format used polyethylene film and balloons (5). After a number of presentations, it seemed desirable to unite, both visually and physically, the hanging panels and the lifting devices. Several grants (6) permitted this exploration. The constructions flown during this grant period were made out of mylar and polyethylene.

The responsibilities of the sky artist do not stop in the studio with the fabrication of the sensor. Numerous pre-event activities are set in motion. Airplanes are chartered and monitoring teams are organized for aerial and ground tracking. Photographic documentation is planned. A flight trajectory is projected and announcements are drafted and sent to the news media. These inform the public in advance and request sighting information. Self-addressed identification cards are prepared to request terminal data and to facilitate removal from the environment for those lost during tracking.

Before the flight an official report is telephoned to the regional flight service station in accordance with F.A.A. regulation No. 101.37. County road maps covering the direction of flight are obtained for tracking, along with walkie-talkie radio sets. A series of pre-launch reminder telephone calls are made to local officials, police, radio and information sources, to update them on any changes in plans. The 20 assistants pack the truck with the helium tanks, supplies and the sculptural components stored in their traveling tubes.

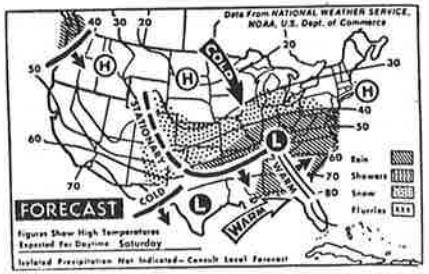
At the site the supplies are carried to the inflation spot. The components are unrolled to expose the gas envelope, and inflation proceeds.

Launching instructions are exchanged by walkie-talkie with the aerial tracking team for timing of simultaneous release.

Over one hundred flights of various sky sculpture sensors have been flown to date. A number of sensors have been presented in contrasting atmospheric environments to compare flight data. When comparing the data from the 12 flights of *Space Barricade*, a 66 percent total documentation has been recorded. Of the undetermined landing sites, a geographical consideration must be noted. Three flights drifted towards and disappeared in inaccessible swamps, which limited the possibility of their recovery. After a few months of being exposed to the natural elements, the components would be so deteriorated that their discovery would be unlikely.

Possibly the best documented of the *Space Barricade* flights was the one in Februray, 1975, from the Mint Museum of Art in Charlotte, North Carolina. A park setting behind the Museum was used for the launch (Fig. 1). The wind was unstable, as if it shifted directions. Ground pressure was 10.210 m.b.s.; at 60 degrees F. with a 40 percent dew point (Fig. 2). Several hundred spectators came to this park setting to view or participate in the event. The sensor was flown in a tethered manner for a brief time. At the launch a concern for a safe

MINT MUSEUM



WEATHER

liftoff was expressed. The spectators emotionally encouraged it to float over the trees, with arm waving and "body-english" jestures followed by cheers as it safely left the site.

BARRICADE: tethered position

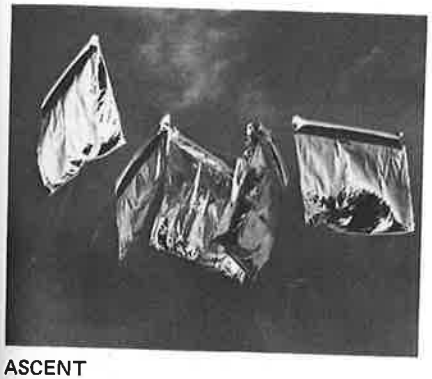
The 2:55 p.m. launch began with a vertical ascent which arced from northwest to north to east over the nearby area. The flight was viewed by many residents, who reported numerous UFO sightings. The initial five-minute ascent rate was 380 feet per minute for the first 1,900 feet or an average of 333 feet per minute for the initial 15 minutes and 5,000 feet.

During the ascent the tracking airplane had difficulty keeping up with the sculpture's trajectory. After about ten minutes, it shifted to a 026 degree or north-northeast course. The flight trajectory formed a bell-shaped curve consisting of a 24-mile ascent, 4-mile peak altitude and a 34-mile descent pattern. The high peak of 7,800 feet occurred 45 minutes after launch in the Kannapolis area and lasted seven minutes. At this point it deviated to a

LAUNCH

course of 321 degrees for about three miles before concluding courses of 036 degrees and 017 degrees.

The components took a vertical stair-step array early in the journey and maintained this configuration

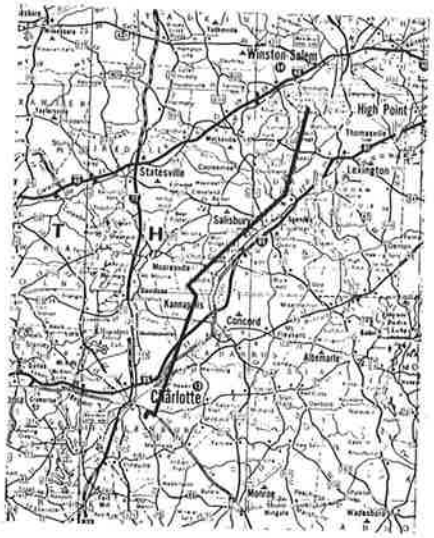


ASCENT

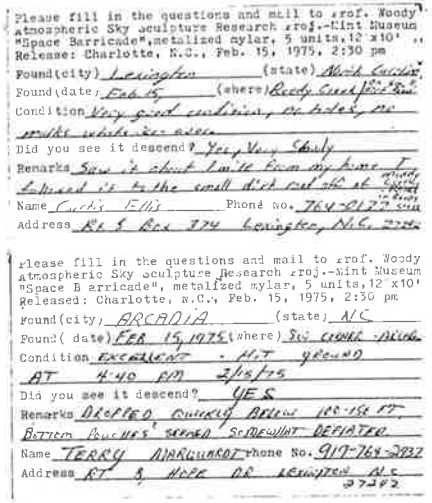
throughout most of the flight. A flight balance was used that permitted a slow lift up to a limited peak altitude, so that it could remain visible to the populace along the entire flight path. At the peak altitude the atmospheric pressure forced the rupture of the gas envelopes as the expanding helium blew numerous openings in the inflexible mylar envelopes. A major rupture developed in one of the panels, causing it to deflate quickly. Each of the other four sections ruptured to lesser degrees but continued to support the sensor. The defusion of helium caused the descent pattern. The four working panels remained in a vertical array as they bore the weight of the underinflated section. The tracking teams records numerous diverse details about the flight.

The aerial team tracked it to its landing point and observed spectator response. Ms. Lafaye, the aerial documentor, saw some children by the field, who, upon viewing it, ran to their house to hide. When the farmer, who was plowing the corn field, saw it, he stopped his tractor and went for cover. The components slowly floated to the ground to hover over the field. By that time a number of cars drove up and the occupants claimed the panels as souvenirs. Two of the group, Ellis and Marquardt, returned the identification cards. An interview with Ellis at the landing site recorded his responses, which had several humorous overtones.

Trajectory data from other events using mylar envelopes have recorded flight distances of from 12 to 1000 miles with in-air time from one to four and a half hours and peak altitudes of up to 11,000 feet using helium as the lifting gas. An opportunity to contrast this data presented itself during a series of 14 flights in England in the summer of 1975. Balloon Gas was substituted for helium. This impure helium lifted similar components to



MAP DOCUMENTATION Charlotte-Arcadia



Please fill in the questions and mail to Prof. Woody
Atmospheric Sky Sculpture Research Proj.-Mint Museum
"Space Barricade", metalized mylar, 5 units, 12' x 10'
Release: Charlotte, N.C., Feb. 15, 1975, 2:30 pm

Found (city) Lexington (state) North Carolina
Found (date) Feb 15 (where) Reedy Creek Park
Condition Very good working in lake, no
smoke while I was there
Did you see it descend? Yes, Very Clearly
Remarks Saw it about 1 mile from my home I
followed it to the small dirt road off of Reedy
Creek Park
Name Curtis Ellis Phone no. 764-2122
Address Rt 5 Box 324 Lexington, N.C. 27292

Please fill in the questions and mail to Prof. Woody
Atmospheric Sky Sculpture Research Proj.-Mint Museum
"Space Barricade", metalized mylar, 5 units, 12' x 10'
Released: Charlotte, N.C., Feb. 15, 1975, 2:30 pm

Found (city) ARCADIA (state) N/C
Found (date) FEB 15, 1975 (where) SW CORNER FIELD
Condition EXCELLENT - HIT GROUND
AT 4:40 PM 2/15/75
Did you see it descend? YES
Remarks DROPPED QUICKLY APPROX 100-150 FT.
BEFORE BOUNCED SOMEWHAT DEFIATED
Name TERRY MARGUARDT Phone No. 917-764-2832
Address RT 8 BOX 88 LEXINGTON N.C. 27292

IDENTIFICATION CARDS

altitudes of up to 5,000 feet with similar time in-air lengths from 45 minutes to about two hours and flight distances of six to 28 miles. The trajectories seem to be somewhat reduced by the smaller lifting power of the substitute gas.

In summary the director selects a particular block of energy from the on-going sky environment and places a sensor in it to respond to those forces. The response of the artistic organization is significant in relation to its ability to visually define nature's air structure. The viewers perceive this by participting in the setup and launch and then by following its flight until the landing. This primary relationship is obviously limited in the number of people who can observe it. For those unable to have this opportunity, documentation is a secondary means of perception. The documentation of a flight records the motion patterns, trajectory, and environment by films, photographs, weather data, charts, amps and the response of participants and spectators.

NOTES AND REFERENCES

1. Howard Woody, "Atmospheric Sky Sculpture," *Studio International,* London, England, June 1974, Vol. 187, No. 967, pps. 301-302.

2. Howard Woody, "Atmospheric Sky Sculpture: An Event Not an Object," *SECAC/Review,* Columbia, South Carolina, No. 2, Spring 1974, Vol. VII, pps. 38-40.

3. Howard Woody, "Atmospheric Concepts, *SECAC/Review,* Columbia, South Carolina, Fall 1973, Vol. VI, No. 2, pps. 16-19.

4. Howard Woody, "Atmospheric Sculpture: Concepts, Procedures and Events," *SAS Quarterly,* Huntsville, Alabama, Winter-Spring 1974.

5. Howard Woody, "Kinetic Environmental Art: Sky Sculpture." *Leonardo,* Paris, France, Summer 1974, Vol. 7, No. 3, pps. 207-210.

6. University of South Carolina Research and Productive Scholarship Grant, South Carolina Arts Commission Grant; U.S.C. Art Department Research Leave.

Jean-Luc Davel, "L'Appropriation de la Nature," *Art Actuel 1975,* Skira, Geneva, Switzerland, 1975, pps. 46-49.

C. Rossignol, "Agora 2," *Musee D'Art Moderne,* Strasbourg, France, 1974, pps. 53-55.

Donna Meilach, "Soft Sculpture," *Crown,* New York, 1974, pps. 6, 201, 218-219.

Howard Woody, "Atmospheric Sky Sculpture," *Sandlapper,* March 1976, Vol. 9, No. 3, pps. 36-41 and cover.

Pierre Restany, *Domus,* Milan, Italy, November 1974, pg. 54.

THE PAPER ARCADE

Helen Escobedo
Mexico

Proposal

A long corridor, a passageway, a link between the campus and Lakeshore Drive.

Today, man treads through endless corridors—in the underground, hotels, hospitals, schools, etc.; fast, functional, sheltered—they propel man from one end to the other; that is all.

We have lost the privilege to gaze and be entranced as we walk under and along these narrow spaces—light and dark, cool and warm—our senses alert to shadows, textures, openings, to gaze and be excited by our wanderings.

These feelings I should like to inspire in the *Arcade*. The basic materials I have chosen are simply cardboard tubes of various lengths and widths. They can support, hang, lean and lie in dozens of different ways. If linked together vertically, they form a textured wall; if suspended horizontally and at intervals, they create a chiaroscuro ceiling. If hung in clusters from a wire crossbar, they sway like so many trees in the wind. They can be colored, chopped into rings, or sliced lengthwise. They can form bucket seats, tables, or circular windows, and can act, in fact, as a wooden log might and with quite as many possibilities for delving into.

This introduction is Utopian.

The Introduction is only the beginning of an environment. If 20 students each have a vision, we start with 20 visions; we are rich! Add to this the ones we have collectively, these triggered by the group's excitement, and we should have more positive suggestions than we can cope with. We shall choose the best, the most feasible and then get to work—cutting, splicing, painting, knotting and tying. This could take three days, plus a day or two for working on the site during the inauguration. The final spectacle will involve total completion on the *Arcade*, and by mid-afternoon the public can wander through and perhaps participate in a final structure made of leftovers.

Project

The *Paper Arcade* environment was thoroughly planned as follows.

In December, 1975, I went to New Orleans for one day to 1) choose the site at the University of New Orleans; 2) talk to the Dean of the School of Architecture at Tulane who had asked me lead a seminar with a group of 20 first-year students; 3) decide on the materials available and the conditions of the site regarding ground, weather, and humidity, for an ephemeral or permanent work.

I arrived two weeks prior to the Ninth Conference to lead my student group into the actual making, painting, and placing of the environment.

In my studio I designed the core idea, the main corridor, based on paperboard sonotubes which Container Corporation of America generously donated according to my specifications.

On the scale model I left various openings or doorways for student projects.

When I arrived to give my first lecture, I was astounded to find that already the students each had a scale model proposal to add to the corridor. I was delighted with Professor Jacobs for having motivated the team in this way. They selected the five most feasible models (I removed two of my proposals to accommodate the new entries) and we got to work painting, drilling, and staking out the project for final completion on Saturday.

I have always believed in team work; now I am convinced that it was an enriching experience for all of us, solving immediate problems, helping each other, and coming up with creative solutions.

I should like to add that quite as much work went into this ephemeral work as would go into a permanent piece.

Certainly the public, particularly the children, enjoyed it enormously. It seemed a shame it would last only 24 hours. However, what mattered in this case was the working experience and the total effect; permanence was a secondary thought. This piece gave us food-for-thought for future projects involving the public, child play, and the use of color and spaces within larger, wilder environments.

THE PAPER ARCADE

Helen Escobedo

INNERTUBE SCULPTURE

Johann Eyfells
Florida

My exhibitions, art marathons, and workshops involving innertube sculpture have met with considerable success since 1971.

In assembling these sculptures, I make no attempt to disguise or revise the industrial character of the tubes. They are simply slipped and/or tugged together into inflation-locking configurations.

As sculptural elements, the tubes are tremendously effective in their resilient, sensuous, vulnerable, clumsy, tactile appeal. While working with the undulating qualities and the extreme pliability of the innertubes, a heightened awareness of time and a strong sense of an ever-present metamorphosis becomes inescapable. As these sculptures are essentially ephemeral in nature, it is, indeed, a rewarding experience to be an integral part of a ceremonial cycle consisting of the "birth-life-death" aspects of a work of art.

My conviction that the roots of art lie in ceremonial and ritualistic activities receives reinforcement through each art event. I believe this fundamental conclusion holds equally true whether a work of art is created in the privacy of one's studio space or in a public workshop. During the process of creating in public, I do not consciously take the audience into account. Rather, each piece is essentially formed during periods of personal psychic unity attaining a sensation of the structure and the boundaries of the work, rather than firmly articulated configurations.

In answer to the most frequent question asked during an art event—"What is it?"—I have no ready reply. In general, spectator involvement and interest revolve only about the visual-tactual qualities of the work and in the way it was produced. On a deeper and a more gratifying level a few viewers also have shown appreciation of the ritualistic and the cyclical nature of the art event.

LAUNCHING

Johann Eyfells

FLOATING RUBBER SCULPTURE Johann Eyfells

FLEXULES

Robert MacBride
New York

DESIGN, TESTING AND EXECUTION

Creating sculpture that is both "monumental" and "ephemeral" involves many fundamental questions of "technique" and ultimately, of form and concept as well. Rather than attempting to deal with them in general, however, this paper will simply describe a particular example: the twin *Flexules* which, with more than a little help from my friends, I put together at the University of New Orleans campus on April 3, 1976.

DESIGN SPECIFICATIONS AND CONSTRAINTS

Although the artists were permitted complete freedom with regard to subject, choice of materials and even scale, the invitation extended by the Ninth National/International Sculpture Conference was quite specific about one important limitation: No heavy equipment or trained construction crews would be available. Any local support would be ad hoc, and perhaps, impromptu and *imprevu* as well. Of almost equal significance was the time frame specified for construction. The ephemeral monuments were to be erected between 10:00 a.m. and early afternoon on the final day of the Conference.

These two constraints were of critical importance in all the subsequent design activity, beginning with the following performance specifications:

1. The sculpture must be subject to comprehensive testing off-site, under conditions comparable to those anticipated for the final erection/assembly.
2. Construction materials, methods and techniques must be "fail-safe" in every respect.
3. Design, including assembly procedures, must be amenable to "graceful degradation."

The first of these criteria hardly needs explanation. The whole operation had to be rehearsed, and consequently, rehearsable. The other two, which borrow from the lore and practice of systems engineering, may need further definition: "Fail-safe" simply means that if something does go wrong, it must go wrong in a way that causes no harm and, ideally, can be easily fixed, as, for example, when an electric fuse blows. "Graceful degradation" is a little more complex, and perhaps it is made more so by the picturesque combination of terms. Using the electrical example again, if the system becomes overloaded and, instead of "blackout" there is a dimming of all the lights, etc., the system can be said to be degrading gracefully.

DESIGN STEPS

Consideration of the above criteria led directly to the following design specifications:

1. The sculpture was to be a mechanical assembly of a number of interchangeable modules of consistent size, form and material.
2. These modules were to be assembled in a "stressed planar" configuration, with flexible joints or intersections. The material of choice, on the basis of strength, weight, availability and cost was to be marine-grade fir plywood.
3. Overall length of the module was to be 10 to 15 feet.
4. The form of the sculpture was to be tetrahedral.

(An additional, though less explicit, specification, was that the artist was to be thoroughly familiar with all the technique, etc., implied by the other specifications.)

Given these parameters, an almost infinite range of possibilities existed

with regard to the actual configuration. The flexible stressed module, or "flexule" (a word invented by the artist) approach, permits the use of lightweight materials with no support structure whatever. The hinge joints, sometimes called "vector active joints," are capable of distributing the most complex stress patterns evenly and efficiently. Their variable character also eliminates the need for close tolerances and detailed calculations, characteristic of, for instance, the constructions of B. Fuller and others.

These features tend to permit the flexule to be used as a vocabulary and syntax of three-dimensional form, capable of defining the most complex sets of planes and/or closed figures. The entire concept is somewhat analogous to musical notation and composition.

In view of the constraints already mentioned however, the simplest three-dimensional "shape" known—the tetrahedron—was chosen.

CHARACTERISTICS OF THE TETRAHEDRON

Although it is the simplest shape conceivable, the tetrahedron is rarely encountered in the real world. Most people, in fact, have never seen one and would not recognize one for what it is, even if they did. Its simplicity, moreover, is deceptive—rather like the simplicity of a black and white drawing. Its superficial geometry is easily described: a set of four points in a three-dimensional array, all equidistant from one another. These four points can be connected by six straight lines of equal length. Together they define a set of four intersecting planes. The intersections form a set of four equilateral triangles. (Fig. 1).

At this stage the tetrahedron may appear to have yielded all its secrets. Not so. Hidden within its four planes and six edges is a universe of possibility and of rigorous logic as well. One brief example: If any one of the six lined joining any two of the four points is bisected by another line passing through the center of the tetrahedron (i.e., a point equidistant from the original four points), that new line will also intersect a second of the six lines. The new line will be exactly perpendicular to both lines. Further investigation will reveal that the two original lines extend in directions that are perpendicular to one another. In addition, these two lines lie in planes which are parallel to one another. These same conditions, obviously, apply to the other two pairs of lines that form the remaining edges of the tetrahedron. (Fig. 2).

These properties of the tetrahedron, while quite elementary, appear to be virtually unknown and quite unappreciated in a structural context. Moving further, (and skipping a number of intermediate observations in the process), there are a number of other properties which can reveal some highly complex, not to say awesome, formal potentialities. One of these properties was chosen for the proposed sculpture. It can perhaps be best stated by the following question: How can the essentially "triangular" tetrahedron be made to contain "square" (90 degree) corners?

This question had already led to the construction of a number of small models by the artist. These models indicated that such a tetrahedron could exist, and that, instead of its edges being defined by a set of six straight lines, it would embody a set of six complex curves.

While these curves could exist ideally as one-dimensional lines, a more practical model showed that they could be represented by curved strips of some thin material. This approach, moreover, would result in the tetrahedron's having a set of four "box corners" not unlike those used for simple constructions like packing crates. (Fig. 3).

A model constructed along these lines, while highly sophisticated in one sense, appeared to be quite suitable in terms of the simplicity required for the New Orleans event. It could be made of six very light stressed-plane modules with simple hinge joints. Its geometry would certainly compel those modules to curve and twist in a way that would provide considerable strength—to say nothing of a certain visual appeal.

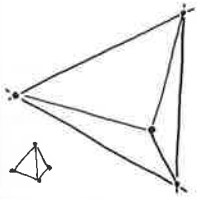


Fig. 1

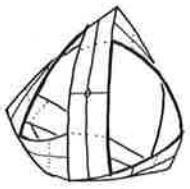


Fig. 3

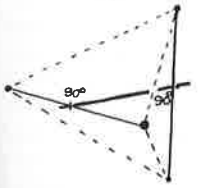


Fig. 2

Fig. 4

CONSTRUCTION

Once the basic design and configuration had been determined by the small models, the criteria of scale and material were reviewed. The modules themselves were to be simple rectangles with an aspect ratio on the order of four- or five-to-one. The joints, conventional leaf-type steel hinges, would be bolted to the ends of the plywood panels. All the required materials were readily available and were relatively inexpensive.

Scale, however, was more difficult to determine. Marine-grade fir plywood was available in lengths up to sixteen feet, and in thicknesses ranging from 1/4-inch to 1 inch. For this particular project the optimum length appeared to be twelve feet, which would be easy to transport and which could be handled by one individual. Even the smallest (paper) models indicated, however, that a precise combination of stiffness and flexibility would be required if not absolutely critical. This would be a function of both the width and the thickness of the material as well as its length. (Plywood, unlike metal, does not tend to "fail-safe." It curves to its elastic limit, and then it breaks like glass.) The question was complicated by the fact that, as the models revealed, each panel would have to "curve" and "twist" simultaneously; plywood, while it curves readily enough, does not like to twist at all.

To better understand these characteristics, several small models were constructed of 1/16-inch mahogany aircraft plywood. On the basis of these, a larger intermediate-scale model was than made. The length of its modules was 4 feet; their width was 6 inches and their thickness approximately 5/16-inch. The material was marine-grade mahogany. All the hardware, hinges, bolts, etc., were as close to scale as possible.

This model proved to be of enormous value in the subsequent design and construction of the final sculpture. It not only provided the essential information for the material selection, it also served as a research and planning tool for the assembly of the full-size model. This occurred in the following way.

After one panel had been "bench tested" for its ability to curve and twist, a set of six were assembled in the box-cornered tetrahedral configuration. This procedure required that after three of the panels had been assembled into the "first" corner, each panel had to be stressed and curved in order to assemble the others. The first time around, this was done more or less by brute strength by the artist and one helper. The experience demonstrated emphatically what the smaller models had indeed suggested: that the limitations of the material itself were really less critical than the degree of sophistication used in the assembly. Put more simply, the first test showed that the plywood could be safely bent and twisted as required, but until the entire set of six modules was secured, the energy

they contained had to be managed carefully at every stage. (Fig. 4). Putting together the four box corners in succession thus created a set of rapidly changing stress conditions with a high degree of instability. At the risk of over-simplification, this instability can best be described in reverse order. When the sculpture was fully assembled with every bolt securely in place, the loads and stresses were evenly distributed throughout the structure; the effect was analogous to an inflated balloon. Just before that last corner was assembled, however, there were considerable loads and stresses that were not at all equally distributed. Some parts of the structure were overloaded, perhaps dangerously; others were hanging loose and unsupported. Prior to the assembly of the third corner, the same disparities of stress existed, but the distribution was quite different. Assembly of the second corner was subject to the same conditions.

Two conclusions were drawn from this exercise. The first was that each step of the assembly procedure would have to be literally choreographed. Each individual involved would have to do certain things in a certain order, whether or not he understood why. And he would also have to *not* do certain things even though they might appear to be right. The second conclusion was that a parallel support structure, internal to the sculpture, would have to be designed and assembled along with the sculpture itself.

The 4-foot model was assembled and disassembled a number of times as the implications of these two conclusions were examined. Different assembly sequences were tried and photographed in detail. At the same time, and drawing on the theoretical properties of the tetrahedron (including the ones shown in Fig. 2) a system of temporary guy ropes was designed and integrated into the panel assembly, which would contain provisions for eye bolts and the like. With the assistance of a professional rigger, some special assembly tools were also designed. All of these additions were made to scale; the light nylon cord that simulated the rope to be used in the final assembly, was color coded, and ultimately, a written "script" or outline of the assembly procedure was written. Part of this effort, it must be added, was due to the artist's conviction that the ultimate 12-foot structure to be erected at New Orleans should itself function as a maquette for even larger, and possibly more complex, structures. All the "technique" thus had to be evaluated in that light.

FINAL ASSEMBLY

When the guying system was deemed adequate, the final assembly phase began. The six 12-foot panels were made of 3/8-inch fir marine-grade plywood, precut at the yard into 2-foot wide panels. A jig was used to drill the 96 holes required for the hinges. The panels were then painted and meticulously coded (including all the holes), according to a scheme developed on the 4-foot model and incorporated into the script. In view of all the effort that had gone into the preliminary design, the final test assembly was somewhat of an anticlimax. Although complicated by a typical assortment of last-minute "problems," (the wind was gusting to 45 m.p.h.; one of the scratch erection crew had a badly turned ankle; another was two hours late), the sculpture was assembled without great difficulty in about an hour and a half. Four people were required, although the experience indicated that with adequate preparation, three people could handle the assembly safely and efficiently. Disassembly could be handled by *one* individual!

The subsequent erection of the sculpture in New Orleans involved some additional, essentially minor design considerations. One of the principal sponsors of the event was the New Orleans Bicentennial Commission. As a gesture of appreciation (and, possibly, of latent patriotism) the artist decided to have the sculpture decorated in *situ* by students from the local arts high school, in a stars and stripes motif. This called for two identical tetrahedrons, one to be painted blue with white stars, and the other obviously to bear red and white stripes. One of the reasons that this scheme was feasible was that in spite of their size, the full-size tetrahedrons were light enough and certainly strong enough to be literally rolled over, so as to successively bring each panel into a postion convenient for painting. (The tetrahedrons were so easy to handle, in fact, that serious consideration was given to actually linking them together into a single structure by passing the panels of one through the open spaces of the other; however, this idea was discarded or deferred at any rate, because of the time limitation.)

CONCLUSIONS

One element conspicuously absent at the "Environmental Sculpture in Process" event on April 3, 1976, was any organized participation by the Fine Arts Department of the University of New Orleans. Although the administration, individual faculty members and students were most helpful when it came to providing ad hoc assistance, and, of course, in managing the events of the day itself, it would appear that a real educational opportunity was somehow overlooked. If certain selected faculty and students could have been able to participate in some of the kind of advanced design and planning just described, and if they had subsequently been able to play a key role in the erection of the "monuments", then the results might have been much less ephemeral than the works themselves. Judging by all the works presented that day, environmental sculpture calls for some highly sophisticated design *and* planning. It also demands a certain kind of experience and confidence which is not readily acquired in a typical studio classroom environment. This artist, for example, was able to draw on an extensive background in films and audio-visual production, along with a familiarity with the principles and practice of systems engineering research and development.

From the informal description of the design and execution of the *Flexules* contained here, it should not be difficult to visualize how similar efforts could be carried out over, perhaps, the course of a semester by a team of fairly advanced students in almost any college art department. Such efforts might well include the participation of students from other departments, too—dramatic arts, architecture, interior design, even engineering are some of the possibilities. The technique, technology and even the materials required for quite monumental results are also within the scope of almost any college art department; those results can be made fairly permanent.

As far as guidance and/or supervision is concerned, most college fine arts faculties are more than capable of providing it. Professional artists who are not on the staff, however, should not be overlooked. Most sculptors dream of "working big"—the bigger the better. To do so inevitably requires help: more than anything else, some willing helpers who will get thoroughly involved in the concept and its execution and stay with it.

photo next page

FLEXULES

Robert MacBride

CEMENT SCULPTURE

Constantino Nivola
New York

The artist has a tendency to attack his material (stone, steel, wood, clay, etc.) as if charging at it on horseback, armed with shield and spear—motivated by extravagant ideals and purposes, such as the saving of democracy, the stopping of wars, the making of history, or the bringing of virtue and justice to the world. The material, bewildered and amused, laughs, "Ha, ha, ha." However, not being completely immune to the charming flatteries, it is willing to step out of its comfortable, inertial condition and let the inspired artist modify its shape, but on one condition only: that the artist give up a great deal of his ambitions and that its (the material) own sensorial qualities be respected and revealed.

From the dialogue between the artist's exaggerated aspirations and the limitations of the material, an agreement may be reached which will bring about a harmonious balance between the material and the idea, a harmony present in all genuine works of art.

The process of carving in green cement is a "common-sense technique" because of its economical ingredients and its fitness in the current methods of industrial construction and transportation. The fact that concrete is the "number-one" building material today (as stone was in the past) makes concrete a logical material to be used for sculpture in an architectural context.

A standard mixture of three parts of screened sand (maison sand) and one part of cement (regular or white) is the basic material needed. This mixture is poured into a wooden box strong enough to resist the pressure of the soft mixture. Two to three hours (depending on the temperature of the air) is the normal time required for the cement to set to a stage in which it becomes firm enough to permit the removal of the sides of the box. The time allowed for work before the material hardens is about five hours.

If the size of the piece is above two feet, it is advisable to build the box in sections of two feet in height. This permits the sculptor to remove one section at a time (as he starts working from the top) thereby releasing some of the weight from the bottom. With experience and familiarity with the behavior of the material, a sculptural form of seven to eight feet may be carved comfortably at one time.

CEMENT SCULPTURE

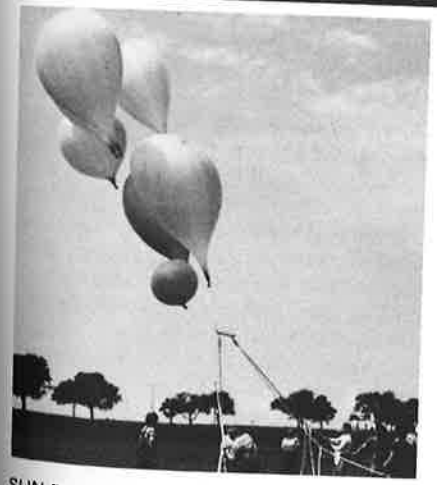
Constantino Nivola

SUN PYRAMID

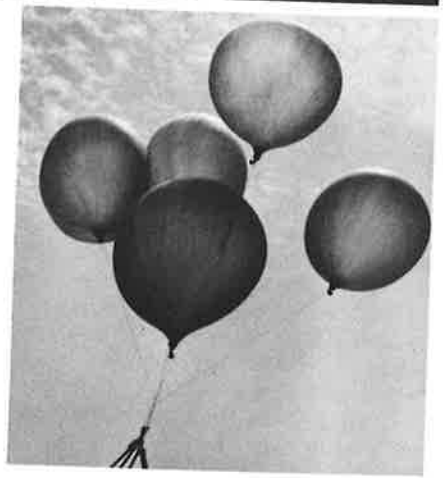
Paul von Ringleheim
New York

Sun Pyramid I was intended through the use of two-inch bright yellow polypropellene cables and three-foot diameter helium balloons to raise a six-story high structure which had the exact proportions of the pyramid at Giza. This work resulted through my involvement with pyramid structures over the last five years. It was my feeling and hope that to create a sculpture of such magnitude (centered on north-south axis) would bring a great deal of the positive energies and aura from the great pyramid to the National/International Sculpture Conference. Although the work was hampered by the poor quality of the inflatable elements, its presence and activity did create a great deal of joy and good will on the part of the audience. Our final release of all ten balloons simultaneously, brought joy and applause throughout the exhibition area.

I have subsequently repeated this project and it was eminently successful. The audience walked and sat underneath the structure and experienced a great feeling of joy and exhilaration.



SUN PYRAMID



Paul von Ringleheim

SKY SCULPTURE FLIGHT

Howard Woody
South Carolina

Planning for this flight began several months before the Conference. Maps of the launch site were studied to determine the characteristics of the open sky spaces as well as the location of potential hazards and obstacles. The findings suggested that *Space Barricade* and *Sky Line* would have the least problems in liftoff. Five mylar panels, 20 feet wide by 12½ feet high, were fabricated for the *Space Barricade* sensor along with a 200-foot long streamer unit for *Sky Line*. These were stored in the studio until the Conference. During this same time initial flight correspondence was begun. A flight proposal was filed with the regional office of the F.A.A., and approval was received along with permission to station a representative at the radar tower of the New Orlean's Moissant International Airport to record the flight data.

The day before the Conference began, the components were transported as luggage to New Orleans by airplane in 10-foot long tubes. Several local pre-flight activities were accomplished upon my arrival in New Orleans. A preparation period was used to transfer the five components from their protective storage transportation tubes to individual launch equipment. The University of New Orleans campus site, wind flow and potential hazards were check ed out and a launch site was selected. Storage, delivery, assembly and launch site was selected. Storage, delivery, assembly and launch procedures were planned. A courtesy telephone call was made to the airport flight-control chief to fully inform him of the flight. Documentation was discussed with the airplane pilot and ground tracking teams. The flight was then ready to go.

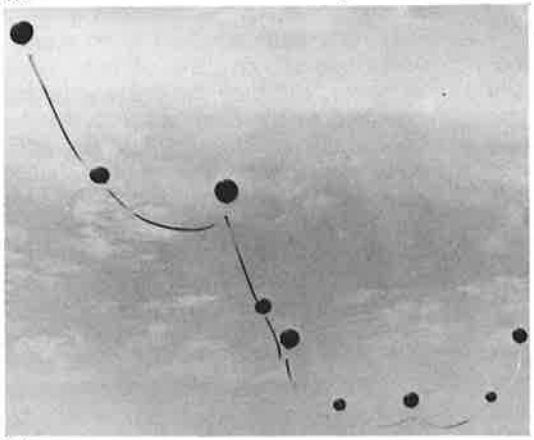
After the presentation of the "Sky Sculpture" paper, (this publication) the components and supplies were then carried out to the grassy laucnch site near the levee. The setup of the initial sculpture, *Sky Line,* began. The inflation of the nine (3 and 4-foot wide) weather balloons quickly occurred. Each was tied to an attachment point on the 4-inch wide streamer, and then the mylar strip was unrolled to the next position. At the conclusion of this activity the 200-foot sensor was positioned in relation to wind flow and hazards (Fig. 1A), and then launched (Fig. 1B). At the release it lazily ascended directly above the launch site (Fig. 1C), before convoluting in on itself (Fig. 1D), as it drifted out of sight and became lost in the upper cloud strata.

Since back-to-back launches were planned, no attempt was made to track this sensor by airplane. Wind charts indicate an eastward flight trajectory over the Gulf of Mexico towards Florida. The sensor's identification card has not been returned; however, the probable landing point was in the Gulf south of the Florida panhandle. Past flights have recorded altitudes of up to 18,000 feet and flight distances of 100 to 400 miles.

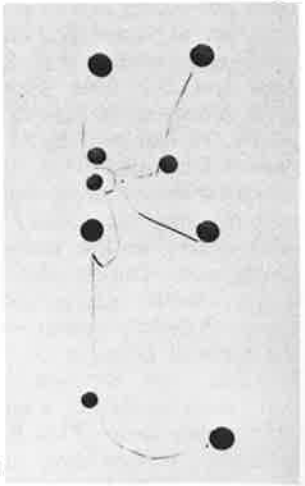
Then the inflation began on *Space Barricade.* Upon completion the launch was temporarily delayed until our representative arrived at the Moissant Airport radar tower and the tracking airplane was over the campus. A hand-held tethered flight (Fig 2A), was presented during this period. It was launched at 1:08 p.m. During the first two minutes the sensor drifted on lake breezes towards the south for the first 1,000 feet of ascent. The slow rise was gentle with a vertical speed of about 400 feet per minute. The next movement was to the west and then to the northwest as it headed out over Lake Pontchartrain. The silver mylar sensor was very visual. The scintillant surfaces shimmered with contras-

1A

1B



1C



1D

Fig. 1 SKY LINE Howard Woody

2A

2B

Fig. 2 SPACE BARRICADE Howard Woody

2C

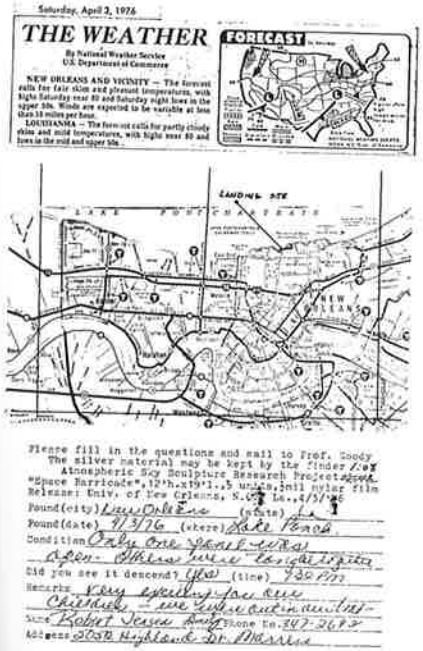
ting flashes of light and color.

The flight array began in an extended horizontal framework. Then each of the five panels bagan to move more independently, and the array changed into a clustered grouping with panels facing various directions (Fig. 2B). A constant repositioning continued with the shifting spatial definitions quite visible. The northwest turn respaced it out, and then it climbed into a vertical stairstep format.

The components' ascent through the changing air density, pressure and temperature (Doc. 1), allowed the helium to expand and rupture the inflexible mylar skin. The lower flight ceiling of 3,200 feet was quickly fashioned by an unpredictable temperature inversion at that altitude, which unbalanced the usual air structure ratios and prematurely blew out the gas envelopes. During the ascent the unit was in constant view from the launch site; however, radar, plane and auto monitors viewed the entire trajectory, which was a short 3¼ miles due to light winds of 7 miles per hour (Doc. 2). The auto tracking assistants watched the sensor hovering over the lake as they alternated between driving and parking along Lakeshore Drive.

The airplande tracking pilot, Joe Hartung, stated, "As long as it was shaped the way it was supposed to be, it climbed beautifully. After it collapsed, the ascent stopped immediately." He reported at 1:16 p.m., about eight minutes after the launch; the ascent ceased and the descent began with a rate of about 300 feet per minute. He noted that it temporarily hovered for a minute at 1:21 p.m. and at about 1,700 feet before continuing the descent.

Meanwhile, the Robert Jensen family was boating, watching and wondering what it was in the sky that was "just kind of hanging there." Mrs. Jensen stated that "about 15 to 20 minutes passed, and it looked like it was starting to come down, so we naturally had to head for it. Once it started to descend, it really came down . . . so we had to move to get it." (Fig. 2C). The components came right on to the boat at about 1:30 p.m., and it was described as having some sections slightly inflated with one panel open and the others tangled together. They returned the identification card (Doc. 3) within the week.



Saturday, April 3, 1976

THE WEATHER FORECAST

By National Weather Service
U.S. Department of Commerce

NEW ORLEANS AND VICINITY — The forecast calls for fair skies and pleasant temperatures, with highs Saturday near 80 and Saturday night lows in the upper 50s. Winds are expected to be variable at less than 10 miles per hour.

LOUISIANA — The forecast calls for partly cloudy skies and mild temperatures, with highs near 80 and lows in the mid and upper 50s.

LANDING SITE

LAKE PONTCHARTRAIN

NEW ORLEANS

Please fill in the questions and mail to Prof. Woody
The silver material may be kept by the finder for
Atmospheric Sky Sculpture Research Project
"Space Barricade", 12'h.x19'l.,5 units,mil nylar film
Released: Univ. of New Orleans, N.O., La.,4/3/76
Found(city) Lake Catherine (state) La.
Found(date) 4/3/76 (where) Lake Pont
Condition Only one panel open. Others
Did you see it descend? (yes) (time) 1:30 pm
Remarks Very exciting for us
Children - we just sat in our boat -
Name Robert Jensen Family Phone No. 347-2672
Address 3038 Highland St. Metairie

Doc. 1, 2, 3 (top to bottom)

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BIOGRAPHICAL SKETCHES

YAACOV AGAM
Born Israel, 1928. Attended Bezaleal School of Art, Jerusalem. Pioneer in kinetic and optical art. Has participated in one-man and group shows all over the world. Many awards including first prize for Creative Research at Sao Paulo Biennale, 1963. Many monumental architectural works such as ceiling at National Convention House in Jerusalem. Presently living in Paris.

OLIVER ANDREWS
Born 1925 in Berkeley, California. Attended University of California and Stanford University. Served in Army Communications in Pacific Theatre during World War II. After the War, worked as engineer, diver and stage designer. Joined faculty of U.C.L.A., 1958. Since then has had twelve one-man exhibitions and participated in numerous group exhibitions. Has executed many architectural commissions for sculpture, lighting fixtures and fountains. At present, work is concerned with sculptural use of water and with airborne and submersible sculpture.

SALVADOR ARANGO
Educated at the Instituto Artes Plasticas. Colombia University. Several individual expositions and many public works. Has exhibited in Colombia. receiving first awards and commissioned work for the Banco de Colombia, Banco Popular Colombia and Sudamericana de Secturos Colombia.

CHARLES (JEFF) BANGERT
Born N. Dakota, 1938. Undergraduate and graduate work in mathematics, statistics and fine arts at Harvard College, University of North Dakota and University of Kansas. Together with Colette S. Bangert, has exhibited, written, lectured and illustrated books. Active in computer art graphics since 1967. Since 1969, Supervisor of Applications Programming, Computation Center, University of Kansas.

JEFFREY J. BAYER
Chairman, Art Department, University of Alabama in Huntsville. Director, 1975 National Sculpture Convention of the Southern Association of Sculptors.

TED BIELER
Born Kingston, Ontario, 1938. Studied art in Paris and London, 1953-54; architecture at University of Toronto 1957-58; Cranbrook Academy, B.F.A., 1961. Numerous commissions and exhibitions. Allied Arts Medal, Royal Architecture Association of Canada 1969. Professor of Fine Arts, York University.

RODERIGO ARENAS BETANCOURT
Born 1919 in Mexico. He has studied in Colombia, Mexico and the United States as well as Italy, France and Spain. His works reside in Mexico, the United States, Colombia and Curacao. He has had several collective exhibitions in various countries.

MARTIN BLASZKO
Born Berlin, 1920. Emigrated to Poland, 1933, to Argentina, 1939. Co-founder of Madi movement in Buenos Aires, 1947. Co-editor: SCULPTURE INTERNATIONAL, 1967-69. Numerous prizes, exhibitions, and commissions. Lives in Buenos Aires.

ROGER BOLOMEY
Born Connecticut, 1918. General education in Belgium and Switzerland. Art education: studied with Alfredo Cini, University of Lausanne and at Academy of Fine Arts, Florence; California College of Arts and Crafts. Painter 10 years before changing to sculpture in 1960. Numerous exhibitions and commissions. Vice-Chairman of National Sculpture Center Advisory Board. Teaching: Professor 1968-75, Herbert Lehman College, City University of New York. Presently Chairman, Art Department, California State University, Fresno.

FRITZ BULTMAN
Born 1919 New Orleans, Louisiana. Attended Munich Preparatory School and New Bauhaus, Chicago, Illinois. Recipient of Italian Government Grant for Exchange Fellowship at Institute d'Arte, Florence, Italy; Fulbright Fellowship and Guggenheim Fellowship. Has lectured at North Carolina State University and Tulane University, New Orleans. Taught at Pratt Institute and Hunter College. Since 1947 he has had 18 one-man exhibitions. Represented in numerous museums. Currently maintains studios in New York and Provincetown, Rhode Island.

KENNETH CAMPBELL
Born Massachusetts, 1913. Studied at Massachusetts School of Art, National Academy of Design, Art Students' League. Numerous exhibitions and awards including Ford Foundation Purchases; Guggenheim Fellowship (1965); National Academy of Arts and Letters Award (1972). Participated in International Sculpture Symposium, Vermont, 1968 and Symposion Europaischer Bildhauser, Austria, 1972. Artist-in-residence University of Kentucky and University of Rhode Island. Since 1968, Professor at University of Maryland.

ELIZABETH CATLETT
Born 1919, Washington, D.C. Naturalized Mexican citizen, 1962. Education: Howard University B.S., cum laude; State University of Iowa, M.F.A.; Art Institute of Chicago, Art Students' League; Hampton Institute. Taught at Prairie View College, Texas; Dillard University, New Orleans; Carver School, New York City. Head of Sculpture Department, National School of Fine Arts of the National University of Mexico. Since 1947 has had nine individual exhibitions and has participated in group exhibitions around the world. She has been the recipient of numerous awards.

FRANK COLSON
Born 1931, France. B.F.A., Claremont College; M.S., Syracuse University. Work exhibited in the United States and abroad. U.S.A.I.D. foundry workshops in the United States and South America. Founded Colson School of Art, Sarasota, Florida. Lectures widely and conducts seminars. Author of KILN BUILDING WITH SPACE-AGE MATERIALS.

SUREN DE
Born, 1930. Education: Diploma in Fine Arts and Crafts, Visva-Bharati, 1954. Research Scholar, Kyoto City University of Fine Arts, 1967-68. Professor in sculpture, Kala-Bhavana, Visva-Bharati, Santiniketan since 1955. Numerous awards including First Prize Gold Medal in Sculpture, Calcutta, 1954. First Prize for Sculpture in all India Fine Arts Exhibition, 1962. Several major exhibitions and commissioned works and a number of publications.

KOSSO ELOUL
Born Russia, 1920. Immigrated to Israel, 1924. Studied: Tel Aviv and Chicago Art Institute 1939-43. Initiated Israel Sculpture Symposium, 1962. Artist-In-Residence: University of California at Long Beach 1965 and 1969 at University of Toronto School of Architecture. Executed major works in Israel, Yugoslavia, Austria, U.S.A., France, England, Italy and Canada. Lives and works in Toronto.

GIANFRANCO ERCOLANONI
Assistant to the Cattedra of Sculpture, Accademia di Belle Arti Pietro, received the Presidente Award, Del Accademia di Belle Arti and has exhibited his work in Italy, his native country.

HELEN ESCOBEDO
Born Mexico City, 1936. Studied: Royal College of Art, London. Designs total environments: Montessori school, law firm office, orphanage, and several habitats. Numerous solo international exhibitions and major monumental commissions including a 55-foot sculpture for Olympic Friendship Route, Mexico. Since 1961, Director of Department of Museums and Galleries of National University of Mexico.

JOHANN K. EYFELLS
Born 1923, Reykjavik, Iceland. Educated at University of California, Berkeley, California; College of Arts and Crafts, Oakland; University of Florida, B. Arch., M.F.A. Many solo and group shows, and "marathon" exhibitions. A licensed architect, he has taught at the University of Florida and the Icelandic College of Arts and Crafts. Currently Associate Professor of Sculpture and 3-dimensional Design, Florida Technological University.

FRANKLIN FELDMAN
Born New York, 1927. Admitted to bar, 1952, New York. A.B., 1948, New York University, LL.B., 1951, Columbia University. Editor-in-Chief, 1950-51, COLUMBIA LAW REVIEW. Member: Assoc. of Bar of N.Y.C., N.Y. County, Lawyers Assoc., N.Y. State and American Bar Assoc. Co-author: ART WORKS: LAW, POLICY, PRACTICE, 1974. Advisory Board, Pratt Graphics Center; Advisory Board, Volunteer Lawyers for the Arts; Life Member, Art Students' League.

WILLIAM FETTER
Born, Missouri. B.F.A. in Graphic Design, University of Illinois. Art Director: CHICAGO FAMILY WEEKLY magazine and Higgs Studio; research at Boeing Company and Computer Graphics Inc. Worked with computer graphics applications such as pilot visibility films and computer-animated man for design and TV applications. International exhibitions and honors. Contributed to ARTS IN SOCIETY JOURNAL, 1972; GRAPHICS SCIENCE, 1969. Author: COMPUTER GRAPHICS IN COMMUNICATION, 1964. Since 1970, lecturer at Department of Design, Southern Illinois University at Carbondale.

BERNARD FRAZIER
Born Kansas, 1906. B.F.A., University of Kansas. Studied with Lorado Taft, Chicago Art Institute. Director of Philbrook Art Center, 6 years. First awards in National competition. Numerous exhibitions and commissions, especially in architectural sculpture. Presently Sculptor-In-Residence and Professor in School of Architecture, University of Kansas.

ERIC L. GIBBARD
Group Managing Director of both the Morris Singer Soundry, England and Susse Fondeur, S.A., Paris. He is a fellow of the British Institute of Foundrymen; Assoc. of the Chartered Inst. of Secretaries of London and initiator of the International Guild of Art Founders formed in 1976 to promote artists' right, improve government import and tax regulations and research foundry technology.

BRUCE GITLIN
Born New York, 1942. Fabricator of large-scale sculpture. B.S., Leigh University in Metallurgical Engineering. Co-author of numerous articles. President of Milgo Art Systems since 1963.

MATHIAS GOERITZ
Born Germany, 1915. Studied art in Berlin. Ph.D. in Art History. During War left to paint and write in Spain. Living in Mexico since 1949. Teaching: Professor of Design, National University of Mexico, 1954. Director of Fine Arts and Architectural Design, Iber-Americano Institute, 1957-60. Editor for art section ARQUITECTURA-MEXICO, 1959. Artist-In-Residence, Aspen Institute of Humanistic Studies, 1972. Numerous commissions and exhibitions. Presently head of sculpture at the University of Mexico.

DIMITRI HADZI
Born New York, 1921. Studied: Cooper Union, 1950; Brooklyn Museum Art School, 1948-50; Athens 1950-51. Artist-In-Residence, 1969, Dartmouth University. Awards: Fulbright Fellow, 1950; Guggenheim Fellow, 1957; National Institute for Arts and Letters Grant, 1962. Numerous exhibitions and commissions. Returned recently from Italy after many years to teach sculpture at Center for Advance Visual Studies, M.I.T.

ELWYN WALTER HAWTHORN
Born 1938 Perth, Western Australia. B.A., 1969 from University of Western Australia; A.A. in Art Education (painting) Western Australian Institute of Technology; 1970, Winner of Dianella Plaza Sculpture Competition. Commissioned to erect an 18-foot high welded steel sundial sculpture. Three major exhibitions of painting and sculpture, 1972-74. Represented in numerous private collections. Currently on study leave from Churchlands College of Advanced Education, Western Australia where he holds a lectureship in Art.

LUISE KAISH
Born Atlanta, Georgia. B.F.A., M.F.A., Syracuse University. Studied with Ivan Mestrovic. Awards: Tiffany Grant, 1951-52; Guggenheim Fellowship, 1959; Rome Prize Fellow, American Academy in Rome, 1970-72; Honor Award, National Interfaith Conference on Religion and Architecture, 1975. Sculptor-In-Residence, Dartmouth, 1974. Many commissions and one-man exhibitions, including retrospective at Jewish Museum, New York, 1973. Lives in New York.

LILA KATZEN
Born New York City. Studied Art Students' League, Cooper Union, Hans Hofmann New York and Massachusetts. Awards and fellowships include: Tiffany Foundation; Lannan Foundation; Gutman Foundation; Arch. League of New York, Sao Paulo Biennale (1970); N.E.A. Grant, A.A.U.W. Creative Arts; Goodyear Fellow. Numerous museum exhibitions and commissions. Represented in museum collections including National Gallery of Art, (1976). Presently teaching at Maryland Institute.

PAL KEPENYES
Born in Hungary. Educated at the Academy of Fine Artes, Budapest and the Academy des Beaux Artes de Paris. He has exhibited his sculpture, jewelry and mobiles of multiple movements most recently in Mexico at the Akary Gallery and the Fashion Parade and Accessories Pret-a-Porter Exhibition in Paris and Mexico. His work is part of the permanent collection of the ZZ Gallery, Los Angeles.

KENNETH KNOWLTON
Born Springhill, New York, 1931. B.S., 1953 in Engineering Physics, Cornell. Ph.D., 1962 in Communication Science, M.I.T. Developer of computer graphic techniques and explorer of Inter-face in art technology. Extensive collaborations with artist filmmakers Stan Vanderbeek and Lillian Schwartz. Author of computer languages for list-processing and picture systems for stills and movie production. Professor 1971-72, University of California at Santa Cruz. Employed since 1962 at Computing Techniques Research Department Bell Telephone Labs, New Jersey.

HILTON KRAMER
Born Massachusetts, 1928. Art-critic. B.A., Syracuse University. Studied at Columbia, New School for Social Research, Harvard, Indiana University, Assoc. Editor, Feature Editor, 1954-55, ARTS DIGEST, Editor 1955-61, ARTS MAGAZINE. Contributed to ARTS MAGAZINE, PARTISAN REVIEW, COMMENTARY, NEW REPUBLIC, THE PROGRESSIVE, and others. Author: THE AGE OF THE AVANT-GUARD, 1973. Presently art critic for the NEW YORK TIMES.

ROCKNE KREBS
Born 1938, Kansas City, Missouri. B.F.A., University of Kansas. The recipient of many awards including a Guggenheim Fellowship. Since 1967 has had 14 one-man exhibitions and participated in numerous group shows. His works are in both public and private collections. Commissioned to do Laser and Sun Piece for N.G.A. Art Pavilion at the Bicentennial Exhibition of Art and Technology, Cape Canaveral, 1976. Articles concerning Krebs' work have appeared in many publications. Maintains a studio in Washington, D.C.

ZELJKO KUJUNDZIC
Born Yugoslavia, 1920. Graduated from Royal College of Art, Budapest; postgraduate studies at the Institute of Fine Art. Lectured for Arts Council of Great Britain and University of Edinburgh. Emigrated to Canada in 1958 and became Canadian citizen. Established Kootenay School of Art, 1960. Director of Kelowna Art Center, 1964-69. Numerous international exhibitions. Currently Professor of Art, Pennsylvania State University.

THOMAS W. LADOUSA
Born Kenosha, Wisconsin, 1939. Educated at University of Wisconsin, Wisconsin State University and Southern Illinois University (M.F.A.). Taught at Louisiana State University, visiting artist at the University of Colorado. Numerous one-man and group exhibitions. Has lectured extensively concerning rubber sculpture technique and ceramics. Currently teaching at the University of Southwest Louisiana, Lafayette.

KURT LAUCKNER
Born 1937, Michigan, B.S. Mathematics and Electrical Engineering, University of Michigan; Ph.D. Physics, University of Michigan, 1968. Organized CIRCUIT (1973) workshop/symposium/exhibition; CIRCUIT NCC (1973) and VIDWO I/O (1974) at National Computer Conferences. Involved in uses of artificial intelligence in art and using computers to control sculpture. Chairman, U.S. branch of Computer Arts Society. Currently teaching in Mathematics Department, Eastern Michigan University.

SEYMOUR LIPTON
Born 1903, New York. Attended City College of New York and Columbia University where he received a degree in Dentistry. Began to sculpt in 1932 and is self-taught. Has had innumerable one-man shows at museums all over the world and at the Venice Biennale (1957). Recipient of many honors including Guggenheim Fellowship, Ford Foundation and Architectural League awards, National Institute of Arts and Letters membership. His works are in most public collections in the United States.

WILLIAM LUDWIG
Born 1935, Hartford Connecticut. Attended University of Connecticut, B.F.A.; Hartford Art School and M.F.A., Tulane University. Has exhibited widely in the United States and his work is represented in many private and public collections. Presently a partner in a cooperative foundry in New Orleans.

MAX LYLE
Born Melbourne, 1935. Graduated in Sculpture, 1955, Royal Melbourne Institute of Technology. Grant 1974, Adelaide Festival of Arts. Exhibitions and commissions in Australia. Teaching: Lecturer 1957-59, Caulfield Institute of Technology; Gordon Institute of Technology 1960-62. Since 1963 he has been a Senior Lecturer at S. Australian School of Art.

ROBERT MACBRIDE
Born 1926. Educated at Philadelphia Museum of Art, Atelier Ossip Zadkine, John Hopkins University. An art director, designer and writer, his clients have included I.B.M., G.E., R.C.A., A.T.&T., and Volvo. Technical papers include "Architectural Aspects of the Space Habitats." Books: CIVIL WAR IRONCLADS and THE AUTOMATED STATE'

ROBERT MALLARY
Born Ohio, 1917. Awards: Tamarind Workshop 1962; Guggenheim Fellow, 1964. Numerous exhibitions in computer art. Presently Professor at University of Massachusetts. Director of ARSTECNICA: Interdisciplinary Center for Art and Technology. Currently researching the aesthetics of surface-mine reclamation under a grant from the National Endowment for the Arts.

STANLEY MARCUS
Born New York, 1926. B.A., 1949, New York University; Ed.D., 1972, Teachers College, Columbia University. Book (and dissertation) on David Smith for publication by Yale University. Large-scale welded aluminum work. Teaching: Philadelphia College of Art, 1971-73; Central Connecticut State College, 1973; Chairman of Art, 1974, Nathaniel Hawthorne College. Presently Coordinator of Sculpture, New York University.

ELZA MAYHEW
Born Victoria, Canada. B.A., Classics and French, University of British Columbia; M.F.A., University of Oregon. Studied painting and sculpture with Jan Zach. Awarded: Sir Otto Beit Medal, Royal Society of British Sculptors, 1962. Selected to represent Canada in Venice Biennale, 1964. Numerous exhibitions and commissions. National Sculpture Center Advisory Board Member. Lives in Victoria.

CLEMENT L. MEADMORE
Born Melbourne, Australia, 1929. Educated at the Royal Melbourne Institute Technology. Work in many public collections including the Art Institute of Chicago; National Gallery Australia; J.B. Speed Museum, Kentucky; Atlantic Richfield Collection; Chase Manhattan Bank Collection. Commissions for large outdoor sculptures for Australian Mutual Provident Society; Mexico City. Major exhibitions: the Guggenheim Institute, New York; the Aldrich Museum; the Museum of Modern Art, New York; the Whitney Museum, New York. Has been director of the Gallery A, Melbourne, Australia and president of Sculpture Architecture League, New York.

CONSTANTINO NIVOLA
Born Sardinia, Italy, 1911. Sculptor, painter, architectural designer. Has lived in the United States since 1939. Taught Graduate School of Design, Harvard University, 1954. Numerous exhibitions and commissions including monumental sand-cast reliefs in a technique invented by him. Lives in New York.

ISAMU NOGUCHI
Born California, 1904. Apprentice to Onorio Ruotolo and Brancusi. Awards: Guggenheim Fellow, 1927-28; Bollingen Fellow, 1950-51; Logan Medal, Art Institute. Author: A SCULPTOR'S WORLD, 1968. Subject of numerous books and international exhibitions. Commissions include monumental sculpture and sculpture gardens in many countries. Lives in New York and Japan.

BEVERLY PEPPER
Born New York, 1924. Has lived in Italy since 1968. Studied at Pratt Institute, Art Students' League of New York and with Fernand Leger, Paris. Recipient of many awards including XVII Mostra Int. Fiorino. One of three American sculptors invited to Spoleto Festival, 1962. Numerous exhibitions and commission. Most recent show: Hammarskjold Plaza Sculpture Garden, 1975.

ALONZO RIOS
Born 1944, Colombia, South America. Educated at the Instituto de Artes Plasticas University of Antiquia, Med. Colombia. Now Professor at the Instituto de Artes Plasticas, University of Antiquia Med. Colombia. Has most recently exhibited his clay, cement, bronze, wood and iron sculpture in two collective expositions at the Uclea Muestawal of Sculpture, Zea Museum, and in a private exhibition at the Zea Museum.

TONY ROSENTHAL
Born Illinois, 1914, Studied: B.F.A., 1936, University of Michigan; Cranbrook Academy of Art. Awards: A.I.A. 1959, Ford Foundation, Krannert Art Museum, 1963. Numerous exhibitions and commissions. Lives in New York.

KENNETH RYDEN
Born Chicago, 1945. B.F.A., University of Wisconsin; M.F.A., University of Kansas. Numerous exhibitions. Presently Asst. Professor Department of Art and Design, Southern Illinois University.

IRVING SANDLER
Born 1925, New York. Art critic and historian. Temple University, B.A.; University of Pennsylvania, M.A.; instructed at New York University. Currently teacher at State University of New York and is a contributing editor of ART IN AMERICA. Was art critic for ART NEWS, 1956-62; ART INTERNATIONAL, 1960-61; NEW YORK POST, 1960-65. He contributed to NEW YORK SCHOOL, SOME YOUNGER ARTISTS, 1959; MINIMAL ART: A CRITICAL ANTHOLOGY, 1968. Author of TRIUMPH OF AMERICAN PAINTING and HISTORY OF ABSTRACT EXPRESSIONISM.

JOHN SCOTT
Born 1940, New Orleans, Louisiana. Xavier University, B.A.; Michigan State University, M.F.A. Presently Chairman of Fine Arts Department Xavier University of Louisiana. Recipient of numerous honors and commissions. Since 1959 has exhibited in 14 shows across the nation and is represented in the Louisiana State University, Fisk University, and Florida A&M University permanent collections.

GEORGE SUGARMAN
Born New York, 1912. Studied: B.A., City College of New York; Atelier Zadkine, Paris. Awards: Pittsburgh International, 1961-62; Longview Foundation grant, 1961, 1962, 1963; Ford Foundation grant, 1965; N.E.A. grant, 1966. Teaching: Assoc. Professor, 1960-70, Hunter College. Visiting Professor of Sculpture, 1967-68, Yale. Numerous exhibitions and commissions. Lives in New York.

ATHENA TACHA
Born Greece, 1936. M.A. in Sculpture, 1959, National Academy of Fine Arts, Athens; M.A. in Art History, 1961, Oberlin College, Ohio; Ph.D. in Aesthetics, 1963. Sorbonne. Awards: First prize in sculpture, May Show, Cleveland Museum of Art, 1968, 1971. Fellowships: N.E.A. 1972, 1975; Center for Advanced Visual Studies, M.I.T., 1974. Numerous exhibitions. Presently Associate Professor of Sculpture, Oberlin College.

VICTOR TEMMERMAN
Born Belgium, 1924. Studied art 7 years, St. Luke's Academy, Ghent. Teaching: Ghent, Brussels, United States. Exhibited widely in Europe and United States. Works in varied media, from restoration of Gothic sculpture to making large-scale stainless steel mobiles. Presently Professor of Sculpture in Overmere, Belgium.

DONALD W. THALACKER
Born 1939. Studied: B.A., Washington & Lee University; B.Arch., University of California at Berkeley. Registered architect with several West Coast firms including Wurster, Bernardi, and Emmons and Skidmore, Owings and Merrill. Presently Director of General Service Administration Fine Arts Program; administers policy of the incorporation of major art works in federal buildings.

HAROLD VAN TONGEREN
Born Holland, Michigan, 1943. B.A., M.F.A., University of Colorado. Taught at University of North Carolina. Has conducted many casting workshops across the country and has constructed and operated several professional foundries. Currently teaching at San Diego University.

TIBERIO VANEGAS
Born in Colombia, 1937. Educated at Universidanal de Colombia Bellas Artes; Ecole des Beaux Arts, Paris. Full-time Professor of the Sculpture Laboratory at Bogota University, Colombia, and has exhibited his sculpture in plastic materials most recently in Bogota and Caracas in group and one-artist exhibitions. His commissioned work appears at the Universidad Nal. de Colombia—Una Obra.

PAUL VON RINGLEHEIM
Born Vienna, Austria. Educated at Brooklyn College; Brooklyn Museum Art School; Fairleigh Dickerson University, M.A.; Art Students' League; Academy for Fine Arts, Munich. Recipient of many awards, including a Fulbright Scholarship. Many one-man and group exhibitions both in the United States and abroad. Numerous architectural commissions include a World Peace Monument, United States Pavilion, 1963-64 World's Fair. Represented in major public collections in the United States and abroad.

ARKOM VORAJINDA
Born Thailand, 1940. Studied: Pho-Chang College of Arts and Crafts, diploma 1962; College of Education, Bangkok, B.A., 1964; Academie de Bella de Artist di Roma 1964. Also studied with Chit Buaboot and Aree Suthiphan. Teaching: Teacher's Training College, Ubon, Thailand 1966-69. Head of Department of Arts and Cultures and Campus landscaping. Research: (5 years) Folk-art of Northeast Thailand, seminar sponsored by Ford Foundation. Presently studying sculpture at the University of Kansas.

HOWARD WOODY
Born Maryland, 1935. B.F.A., Richmond Prof. Inst., 1958; M.A., East Carolina University, 1962. Graduate study: University of Iowa; Chicago Art Institute; University of Kentucky; Kalamazoo Art Center. Numerous international sky sculpture presentations. Contributed to many art publications. National Sculpture Center Advisory Board member. Presently Professor at University of South Carolina.

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