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PLASTICS IN ART

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IN THE COLLEGE OF FINE AND APPLIED ARTS
OF THE ROCHESTER INSTITUTE OF TECHNOLOGY

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DEDICATION:

to my father, a lovable technocrat, and
to my husband for his love, patience, and
careful typing

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INTRODUCTION

To someone who was the only kid on the block with twenty-six hula hoops and a member of a household where it was rumored that her family ate the raw plastic material "grex" for breakfast, it is not unnatural for me, the daughter of a plastics engineer, to be fascinated with the relationship of plastics to art and society.

While spending a summer evening strolling on a New Jersey boardwalk, my father and I became intrigued by a glib salesman demonstrating the marvels of his food chopper before an entranced audience. My father listened intently, then became an enraged heckler when the salesman described the material of his machine as being long-lasting and durable nylon, not a cheap plastic product. When most of the people had left, my father consulted with the salesman who explained that he would not use the word plastic because it denoted cheapness and would not sell his product.

The story of plastics has not been one of smooth progression. The stresses of the Second World War gave a premature stimulus to their development and produced crudely manufactured plastic products as industry wished to capitalize on war-time technology. Unfortunately, the budding consumer oriented plas-

tics industry flooded the market with unsatisfactory products giving plastics its initial bad name. Although first seen as substitutes rather than materials in their own right, plastics have been the subject of a recent revolution of thought, causing them to be seen now as valuable materials capable of being used to great advantage because of easy manipulation, malleability, high moisture resistance, noncorrosiveness, lightness, and toughness. Today plastics penetrate into every phase of domestic and industrial life due to their low production cost and their generally superior quality to the materials they replace. Plastics are essential to our modern civilization, especially as natural resources dwindle. The implications for our future society, as well as the particular nature of this versatile, man-made material, intrigues me to respond as an artist to the relationship of plastic to art.

PART I ARTISTIC INTEREST IN PLASTICS

THE DEVELOPMENT OF ARTISTIC INTEREST IN PLASTICS

The emergence of any new medium influences aesthetic expression as in the cases of the invention of oil paint which enabled artists to add previously unknown richness to their colors and in the development of plastic paints, known as acrylics, which facilitated easier handling due to their fast drying time. Whereas the invention of oil painting gave rise to the Impressionists' interest in color per se, the development of plastic paints facilitated the Abstract Expressionists' desire to have a feeling of greater immediacy with their paint.

It has been nearly a hundred years since the first plastic material, called celluloid, was invented. Interest in plastics for artistic expression has accompanied the development of the plastics industry. Over fifty years ago Naum Gabo made his first plastic sculpture which was strongly influenced by engineered structures. "In 1920 he [Naum Gabo] and his brother Antoine Pevsner introduced the concept that color and light should be intrinsic to the structure of the sculpture and not just an aspect of the surface, thus paving the way for sculptural interest in clear acrylics."¹ However, it was not until Moholy-Nagy's molded plexiglass works during the 1940's that plastics in art entered a stage of sophisti-

¹Eugene Bolger, "Plastics in Art: A New Dimension," The SPE Journal, September 1971, p. 19.

cation and diversification. Today many artists are exploring the seemingly limitless possibilities of plastics, while creating a host of new forms and visions.

THE REVOLUTION IN TRADITIONAL ATTITUDE TOWARD PLASTICS

A full scale aesthetic re-evaluation of plastics is already underway. The basis for a new awareness can be found in the work of artists who, fascinated by the potential of plastics, are creating an art that reveals the² intrinsic beauty of these materials for the first time.

For the purpose of artistic expression plastics can be used for their own sake, not as imitators or substitutes for natural materials. The artist can use plastics to facilitate the handling or construction of a more traditionally ordered work, mimic the quality of other materials, reveal something of the nature of our society and industry, or create with the specific purpose of displaying the aesthetic qualities of plastic itself, much the same way the Abstract Expressionists used paint to reveal the painterliness of paint. The tremendous potential of plastics can be overwhelming since few natural substances converted by man can offer the multiple advantages of being lightweight, strong, stiff or flexible, colored or clear, textured or smooth, and resistant to corrosion.

"The traditional attitude toward materials has been revolutionized; instead of adopting a given material to a specific neces-

²Bolger, pp. 18-19.

sity, modern technology is able to invent a new material for each necessity."³ Plastics can mean diversity of form, a freedom in execution, and an interest in the benefits of technological growth, as well as an interest in the effect plastic materials can have on society and the environment, thus permitting the artist to express himself with less material constraints and to respond to a material affecting our lives in so many ways.

PLASTIC PRESENCE

Plastics have their unique qualities, a certain reality about them, and lives of their own. For the sake of classification, let this quality be called plastic presence, referring to the confronting surface qualities which are undeniably plastic and unprecedented in nature, bespeaking plastic's encounter with the machine and technological processes.

To work with plastics is to work with an insidious material. It possesses no historical, romantic, or aesthetic qualities that have traditionally excited man's imagination. To work with this material defies the use of traditional tools and materials--it frees men to explore.⁴

There is a delight in working with the undeniably unique qualities of these new materials. Plastics are slick, modern, fashionable, man-made, glittery, reflective, and confronting. Plastics are

³R. Pincus, "A Plastic Presence: Exhibition at the Jewish Museum," Art Forum, January 1970, p. 69.

⁴Pincus, p. 69.

both a blessing and a curse to the artist, who has new materials to satisfy his expanding demands while caught in competition with industry's sophisticated use of techniques and processes.

Awareness of the properties of new materials can provide new means to express old themes or make statements about the present age. For instance, plastics can be either opaque, translucent, or transparent, creating a variety of effects possible with reflected, incidental, and transmitted light. Both inner structures and surfaces can be revealed at the same time, providing a play between positive and negative space. Hence, there are fewer limitations than with older translucent materials.

PLASTICS AND NEW FORMS OF EXPRESSION

The great flexibility in determining properties of plastics facilitates a high degree of manipulation of form on the part of the artist. Painters are becoming fascinated with the malleability of certain plastics and are beginning to expand their work into three dimensions, while sculptors are becoming concerned with painting and are producing multi-colored cast resin forms. The materials themselves often lead to the creation of new forms of expression for the artist, the motivation coming directly from the fascination with the potential of the material. "Apart from the technical interest inherent in new materials, there is also inherent in new materials known as such--the wish to display them as

materials and to develop their wildest possibilities."⁵ Conversely, the desire for new modes of expression may give rise to the development of new materials.

The artist now has at his disposal far greater means to deal with color, line, space, form, and texture which allow him to be more in tune with the complexities of modern society. "The new plastic's strange potential is bound to change traditional art forms because of the new technical demand and innovation the substance requires."⁶ There are a host of materials available in many forms, each with its own properties. Perhaps this is why in viewing modern art there are no longer clear-cut distinctions in the classification of works and we are faced with far greater diversity of contemporary styles such as the world has never seen.

⁵Alfred Newmeyer, The Search for Meaning in Modern Art, (Englewood Cliffs, New Jersey: Prentice Hall, 1964) p. 36.

⁶E. G. Couzens and V. E. Yarsley, Plastics in the Modern World, (Baltimore: Penguin Books, 1968) p. 21.

PART II THE PROPERTIES OF PLASTICS AND THE PROCESSES
AND TECHNIQUES FOR FABRICATION

PLASTIC PROPERTIES

Successful use of any material either man-made or natural depends on the integrity with which it is used, a knowledge of its properties, and an understanding of the working techniques. Risks are involved beyond loss and damage to materials when the user is ignorant of physically harmful properties such as toxic fumes, harmful dust, combustability, etc.

Plastic materials will retain their new form when subjected to a process of moulding or shaping. Plastics are a group of synthetic materials composed of carbon, oxygen, hydrogen, chlorine, fluorine, and/or nitrogen. By the use of external force such as heat or pressure, plastics can be made to flow into a new shape which will be maintained when cooled or acted upon by pressure, chemical action, or removal of a solvent through evaporation. This process, called polymerization, makes possible a large number of combinations which yield polymers with differing unique properties. Knowledge of these differences is essential if the artist is to know what techniques are applicable for a particular form of expression.

Just as the various types of metals are defined in broad categories such as gold, silver, and copper, plastics are defined according to specific types such as polyesters, epoxies, acrylics, and phenolics. They are also broken down into the two major categories of thermoplastic polymers and thermosetting polymers. Thermoplastic polymers are heat sensitive materials which, when exposed to a proc-

cess of heating and cooling, will first fuse and become liquid, then cool and harden, always to remain sensitive to this heating and cooling process. This group of plastics includes the acrylics, celluloses, nylons, polyethylenes, polystyrenes, polypropylenes, and polycarbonates. These plastics can be fabricated by milling, injection moulding, extrusion, rotational casting, and calendaring. Fabrication methods which take advantage of heat sensitivity are vacuum forming, blow moulding, and forging. Thermoplastic polymers may also be joined by chemical solvents. Thermosetting or thermohardening polymers are plastics which undergo a chemical change in the course of manipulation at high temperatures which sets and makes them chemically insoluble. "The thermosets will not become fluid again if heat is applied but will remain solid up to their decomposition temperature."⁷ The closest nonplastic counterpart to thermosets in properties are ceramics. This group includes the phenolics, urethanes, and caseins. They are the stiffest of all plastics, having better long-term dimensional stability than thermoplastics, but are more difficult to fabricate. Thermosets are recognized as moulding powders, casting resins, and laminations. Moulding powders are fashioned into articles by injection, compression, or transfer

⁷Thelma R. Newman, Plastics as an Art Form, (New York: Chilton Books, 1964) p. 25.

moulding. Cast resins are special forms of thermohardening polymers which can be cast or poured into a mould or are supplied in preforms ready to be machined. Both types of plastics start as liquids, pastes, granules, pellets, powders, foams, emulsions, films, sheets, rods, tubes, or solid volumes.

It is possible to modify plastic properties by the use of fillers, plasticizers, antioxidants, colorants, stabilizers, and catalysts. As examples, plasticizers act as lubricants between the polymer molecules which enable them to slip and slide facilitating control over the flexibility and hardness of the material, fillers enable changes in density and strength, while stabilizers resist the effects of weather and high temperature. With such controls a plastic product can be designed to meet specific needs of both industry and the artist. Various properties should be considered before selecting a plastic: impact strength, the degree of resistance to shock; melt index, the degree of ability to flow; yield strength, the degree of retention of original shape under stress at room temperature; creep, the degree of gradual change in dimensions under stress; as well as transparency, shrinkage, warpage, and rigidity.

PROCESSES AND TECHNIQUES FOR FABRICATION

Plastics respond to a variety of processes and techniques for fabrication. Lamination is a process which enables the embedding of a fibrous material into a resin with the assistance of heat, yield-

ing rigid sheets or structures which can then be machined like wood. Forming is a process which enables the artist to heat bend, cut, machine, bond, and vacuum form plastics. Casting is a process which allows him to pour liquid polymers into a mould in order to create three-dimensional forms. Carving is a process which allows the artist to shape cellular plastics, solid acrylic blocks, or laminated volumes, while polychroming enables him to paint plastic materials with plastic-based paints.⁸

There are four basic methods of joining plastics: mechanical linkage, adhesive bonding, thermal bonding, and solvent bonding. Mechanical bonding methods involve the use of screws, bolts, hinges, clips, etc. Metalworking and woodworking devices are readily adaptable to plastic. Adhesive bonding involves the use of an adhesive which will bond the plastic material without dissolving or otherwise affecting the surface. Thermal bonding of thermoplastics involves the use of heat which softens the surfaces of the pieces to be joined and creates a welded joint. Heated tools, high frequency electric devices, friction tools, and hot gas tools are commonly used for this type of bonding. Solvent bonding of thermoplastics is created by using solvents which soften the surface of the materials to be joined, fusing the pieces together. These solvents are applied by the use of a dropper, brush, hypodermic needle, glass tube, or rod.⁹

⁸Nicholas Roukes, "The Plastics of Sculpture: Materials and Techniques," Craft Horizons, January 1969, p. 18.

⁹Roukes, p. 18.

LEARNING ABOUT NEW DEVELOPMENTS

"The artist working with plastics inevitably has to take up scientific studies or else wait decades for the knowledge to become commonplace."¹⁰ In order to make the artist aware of the potential in new materials and techniques the Gyorgy Kepes Center for Advanced Visual Studies at M.I.T., the Aesthetic Research Center in Venice, California, and the Experiments in Art and Technology in New York City provide necessary technical information for artistic pursuits. Universities are also giving short, intensified courses on the handling of plastics for art increasing the availability of new technological developments to the artist. Although these organizations with their course offerings exist, most artists learn about plastics on their own by reading, using the trial and error method, or making connections with industrial personnel willing to provide information and consultation. Efforts and experiments are even being made to house artists within industry.

¹⁰Roukes, p. 18.

PART III THE RELATIONSHIP BETWEEN ART AND TECHNOLOGY

TECHNOLOGY'S PART IN SHAPING US

The growth of technology and mass-produced products has transformed the daily lives of every person living in America. Although everyone has enjoyed the benefits of technology, there is a lingering fear of being victimized by this massive structure over which some feel there is no control. In this electric age of technology Marshall McLuhan, who some consider to be the modern prophet of the Pop Generation, warns of the power technology has in shaping lives. He says that technology is not something neutral, but does something to people to change the way they react by shaping their ideas about who they are, who they want to be, and what they need in order to be that person. In turn this change in image affects the way they react and the way they see their world and other people. McLuhan says that technology shapes and reshapes one's senses by becoming extensions of one's senses. For example he feels that the wheel is an extension of the foot, and technology is an extension of the central nervous system.

Technologies themselves do not impose limits, but often their development for one purpose produces powerful and unintended consequences in many other areas of life. Technologies are created by such forces as human vision, human desire, and human devices which act upon the technological instruments. Choices are being made by men, yet men can render technology

inhuman when they fail to consider the balance needed between technology and natural processes.

THE ARTIST AND TECHNOLOGY

McLuhan feels that the artist is the only person who enjoys living in the present and is always a jump ahead of technology with his new styles of art being a good indication of how people are changing. It is the artist who recognizes that individual needs and values can catch up with change only if people accept the knowledge and tools offered to them by the new scientific technological world. "The question seems not to be whether artists can use new technologies, for that question has long since been answered, rather the question here seems to be the relationship between the artist and industry."¹¹ The artist questions whether it is his job to humanize the technological monster, work directly in industry, collaborate with industry in special cases, or just share the same tools and materials.

"As surely as technology has transformed our daily lives, so it is invading all the arts."¹² People are aware of the

¹¹Report of the Art and Technology Program of the Los Angeles County Museum of Art. Maurice Tuchman, curator. (Los Angeles: Los Angeles County Museum of Art, 1971) p. 84.

¹²Douglas M. Davis, "Art and Technology--The New Combine," Art in America, January-February, 1968, p. 3.

technological sophistication in the new art each time they stand in front of a sculpture that flashes lights, moves, buzzes, or is made out of modern materials.

Technology in other words is man's way of working, no less a part of him than his own brain or hands. Marshall McLuhan is therefore surely right when he calls technology an extension of the central nervous system. There is much more than making and extending in this new art, of course: there is "science" broadly considered, the kind of science that is charting a new metaphysics as well as a new computer based society.¹³

Although the artist has always made use of the most modern tools, the variety at his disposal now has never been so great. Today the artist wants to use the materials industry can provide in order to give new dimensions to his artistic expression and to create public monuments for a new society. He haunts the factory as often as the museum.

THE WEDDING OF ART AND TECHNOLOGY

What are the possible relationships between art and technology?

The idea of wedding art to technology is tremendously appealing. It promises everyone a brave new world--no more alienation....Artists can escape the back waters of art history--to engineers it offers new playmates--for audiences there would be the humanization of the scientific world. What would be nicer than a unified culture?¹⁴

¹³Davis, p. 29.

¹⁴Amy Goldin, "Art and Technology in a Social Vacuum," Art in America, March-April 1972, p. 46.

The recent Art and Technology Program and Show organized by the Los Angeles County Museum of Art reveals what can happen when art and technology merge. Maurice Tuchman, curator of the museum, used twentieth century, Madison Avenue techniques to engage an industry to become the patron sponsor of an artist who's needs would be matched to the industry's facilities. It was suggested to industry that by inviting in an artist, the artist might dislodge the patterns in their think tanks, and thereby result in new industrial developments. It was suggested that industry could gain status by participating in the making of monumental art.

For the artist, the program provided a ready-made large audience, access to materials and research assistance, and publicity; while the museum was given the opportunity to participate in the making of art history. All this amounted to an up-to-date "Patronage System" with the museum acting as middleman and the rewards well in sight. The facilities and research assistance of the large companies and corporations were offered to those the museum considered the right people--most of whom were well-known, well-established contemporary artists, many from the New York school of Pop.

The experiment began in 1966 and ended with the Art and Technology show at the Los Angeles County Museum of Art in the spring of 1971. The collaborative period was three months with

the artists in residence at the patron companies. Two hundred artists were either matched or intended to be matched with companies. In the curator's words, "It was an effort to bring together the incredible resources and advanced technology of industry with the equally incredible imagination and talent of the best artists at work today."¹⁵

FAILURE OF THE ART AND TECHNOLOGY PROGRAM

The Art and Technology Program's interest in joining art and technology did not truly reflect a concern for the value of humanization of technology and democratization of art, but reflected an elitist desire on the part of Maurice Tuchman and the artists to create art from such complex and expensive machinery as programming, laser, film, lighting, sensing, motion, and timing devices. Perhaps the failure of the Art and Technology program to produce significant works of art was because of what should be called the "candy store syndrome." The artists were encouraged to gorge themselves with all the new complex technology, not simply to make use of technology in their work when it was necessary. Their fantasy ran wild and conceived of works demanding millions of dollars and unreasonable staff time. As a result, less than ten percent of the works were completed, and those that were finished tended toward sen-

¹⁵David Antin, "Art and Corporations," Art News, September 1971, p. 24.

sationalism, gadgetry, and short-term entertainment. Industry resented the artists' demands; the artists resented the bureaucracy involved in industry's decision making; and the audience resented the lack of seriousness in the works created.

THE ART AND TECHNOLOGY SHOW

The Art and Technology Show resulted in only sixteen works. Included in the show were a giant mechanical ice bag by Claes Oldenburg, a mirror and laser piece by Rockne Krebs, strobe colored walls by Boyd Meffert, filmic paintings by Roy Lichtenstein, bubbling mud by Robert Rauschenburg, a rain machine by Andy Warhol, a graphic display of computer designs by Jesse Reicheck, stacked metal sculptures by Richard Serra, cardboard tetrahedral and octahedral structural boxes by Tony Smith, and plexiglass cut-outs by Oyvind Fahlstrom. "If this show, from three to four years in the making were to be judged on the basis of these objects the way a painting show or a sculpture show might be judged, solely on the basis of the paintings within it, the verdict would be disastrous."¹⁶ However, there is much that can be drawn from this experience. The art reveals the nature of the artist's experience within industry and a clue to the significance of the joining of art and industry

¹⁶Antin, p. 24.

THE ARTISTS SPEAK

Lichtenstein speaks of his experience this way:

I must say there are so many things that people want you to do. I think you could fill orders and never go in your own directions. I prefer not to be led....I like to work in my studio and let one painting lead to another....The thing that's advanced scientifically is the theory. The artists don't get anywhere near the theory; they're using the equivalent of a refrigerator or a light bulb or some by-product of the theory.¹⁷

Claes Oldenburg comments about his experience this way:

As far as I'm concerned...The Yellow Pages provides enough technology for me....The practical way to approach working with a company or corporation or any material or technique supplier is to see where their services fit with your needs. And first of all I ask myself what it is in my work that requires technological assistance. I think that this is theatre--pulling together all these families of people and their interaction. This is really living theatre. Technology is an available material, which is very different from certain conventional ideas of artistic activity in that it involves using skills that the artist does not necessarily possess.... I'm asking someone else to do it for me. The question is can anyone else do it for me or could I allow other people to do things I don't know anything about?...Technology is very deterministic--the activity in the studio is so much more fun because you can change things constantly. In technology you have to be very sure of what you are doing before giving the orders to go ahead and yet it is a very challenging thing....It is almost like lion taming with technology this way. I suppose it would be very difficult to feel like a modern artist if you weren't in some way coping with the presence of things you don't understand. There's so much surrounding you, so much specialization that you don't comprehend. And the artist is supposed to be the person who can unify or make a whole out of diverse things--to give direction and order and he has to contend with technology and specialization, so I think it is a kind of necessity forced on the artist by the times. I would like all this complexity that technology can provide and direct it toward simple solutions which equate it more with nature.¹⁸

¹⁷Tuchman, pp. 97-98.

¹⁸Tuchman, p. 227.

Boyd Meffert states:

My entire premise for a good work of art is that it transcend materials to reach esthetic consistency....I think that the reason that we have seen so little quality in art and technology projects is that artists have spent too much money and energy trying to compete with industrial consumers who need technology to make things expedient. Art and artists' standards are still quite different from the motivations of industry and it seems out of place to expect both groups to be able to use the same hardware.... The materials the artist works with are of secondary importance to traditional art habits.¹⁹

INSIGHT INTO THE PROBLEMS

When the artist meets the engineer, chemist, or scientist, there is a confrontation between those who would reduce all questioning to a matter of test taking and those who would expand the act of creating into pure conditions of being and concept. "The permissive atmosphere in the art world, that which licenses and sanctions the artist's most extravagant conceits, evaporates as soon as his context is changed to one where men are supposed to be doing things seriously and for a purpose."²⁰ Unless the artist and scientist are committed to a project where both are challenged to meet a singular goal, collaboration will not accomplish the purpose intended. At the Gyorgy Kepes' center for Advanced Visual Studies at M.I.T. projects of depth and interest have been

¹⁹Tuchman, p. 227.

²⁰Max Kozloff, "The Million Dollar Boondoggle," Art Forum, October 1971, p. 75.

successful in using the talents of artists and engineers.

By becoming involved in the artist's imaginative process the scientist can discover in himself avenues of imaginative power that might ordinarily be bypassed. Notwithstanding the highly abstract mathematical conceptual ways scientists approach their problems today, there is ample evidence that some major scientific insights and technological discoveries were initiated through visual esthetic experiences.²¹

Getting the artist to collaborate is another matter. The fine artist is used to making unique creations of which he alone is the author, and the very nature of working with industry demands collaboration. But the artist does not have to reside within industry where he is subject to the regimentation and hierarchy of the corporate structure. Industry can be a resource, and through such organizations as Experiments in Art and Technology industry can come to the artist to explain techniques which the artist wants to know. The difficulty for some may be the change in relationship between the artist and his work while executing a work of technological art. "The artist conceives of the image, but no longer executes it himself. Months can intervene between idea and execution, and he must consult engineers, chemists, and technicians."²² Some artists' personalities are not suited to joint effort and this relationship is usually more than they want even temporarily; while artists such as Les Levine,

²¹David, p. 40.

²²Anita Aarons, "Plastics," Arts Canada, August 1968, p. 20.

Donald Judd, Robert Morris, Craig Kaufman, John McCracken, and others work directly with factories, never touching their work.

THE ARTIST CHOOSES TECHNOLOGY

Les Levine, called the "plastics man," telephones his orders to plastic plants and never sees his work until it is delivered. If it does not suit him he sends it back for adjustments. He feels this is a realistic way for the modern artist to respond to the benefits of technology.

In an era alive with plastic boots, raincoats, dresses, and inflatable plastic chairs, plastic as a medium seems no more artificial than a metal alloy or "chromium" colors. No material is intrinsically human or inhuman; these adjectives can only be applied to its uses.

Les Levine does not use plastic as a novelty ingredient or as a substitute for a more costly material. He uses it as a material with its own validity. And this use of plastic is the basis of Levine's two most notorious ideas; the disposable and the unlimited edition.²³

Levine was led by the fact that many plastics were created with characteristics specifically applicable to mass-production to make his plastic art like the plastic product, disposable and unlimited.

The artist chooses technology for many reasons. Freda Koblick has chosen to work with plastic materials and technological products for the last twenty-five years. She feels lured to

²³ John Perreault, "Plastic Man Strikes," Art News, March 1968, p. 37.

plastics because of their unknown qualities and limitless possibilities. Bruce Beasley, an Oakland, California artist, collaborated with Dupont to cast his monumental, six ton, lucite sculpture called "Apolymon," commissioned by the state of California. Never before has such a massive, complex sculpture been cast in acrylic. With the help of industry Beasley's "Apolymon" represents a significant advance in acrylic casting as well as a monumental sculpture cast in modern materials.

It is because of their achievements that a contemporary artist like Larry Rivers can take the stand--in conversation and in his work--that it is as noble to make sculpture out of a light bulb as marble--"Michelangelo saw marble around and worked with it," Rivers says. "I use electricity. What's the difference?"²⁴

MODERN MATERIALS AND THEIR MEANING

The artist has the choice whether or not to use technological information and technological materials. The fact that technology and its products play a major role in influencing the change in modern society make it potential for art. However, one must be careful not to equate modern materials with contemporary significance.

It is inevitable that some people just jump on the bandwagon. No doubt there are some artists who are taking sophisticated technical implements, like the computer,

²⁴Davis, p. 38.

or electronic devices and simply playing with them, not recognizing the essential promise of these devices. But if I am correct, concern with technology must be based upon a real understanding of what technology is today. Technology today does not simply imply a physical implement, "a machine" mechanical or electronic, but a systematic disciplined, collaborative approach to a chosen objective.²⁵

The use of plastics by California artists has been responsible in part for the origin of certain works currently being described as "fetish finish." The "fetish finish" is an immaculate glistening, often translucent surface which conveys the look of a refined industrial process reflective of surfboards, autos, boats, and consumer goods produced.²⁶

A discernable Pop quality, usually present in earlier Los Angeles plastic art, is now mostly discarded in a purist approach to materials, a consuming interest in perfection of surface, reflection, transparency, dematerialization, deobjectification, and above all in an obsession with light. Parallel to this has been a de-emphasis in structure.²⁷

Fascination with modern materials isn't enough if we are going to surpass a preoccupation with playing formalist games. The viewer must do more than question the way something has been made and the artist must be concerned with more than process.

THE NEED FOR COLLABORATION

More than ever before there is a need for collaborative

²⁵

Davis, p. 40.

²⁶Peter Selz and Carol Lindsley, "Plastic into Art," Art in America, May 1968, p. 114.

²⁷Elizabeth Baker, "Los Angeles, 1971," Art News, September 1971, p. 28.

effort among people involved creatively with science, industry, and design so that the special knowledge and talents of each can be more fully realized. Art must have meaning for the individual involved with it because of, and in spite of, the machine.

PART 1V MY RELATIONSHIP TO PLASTIC AND ART

MY BEGINNINGS

My art is a result of an interest in found materials. I've always enjoyed making new combinations with collage and construction techniques which utilized natural color, line, texture, and form. In my early works there was an interest in old, natural materials which led me to junk dealers and junk yards. However, as I worked I became more aware of today's junk--albiet unused--found in discount department stores, supermarkets, the junk of the streets, and that in our homes. In these places I could not help but be attracted to the reflective, glittering quality of today's plastic materials. Their presence is confronting and disturbing, yet inescapably inviting and exciting.

A study of today's materials both on the shelf and in the garbage can be revealing. In the garbage old, used plastics reveal a host of beautifully moulded, colorful forms as well as broken, dirty, scarred, and scratched pieces. In neither case will the plastic materials decompose and blend into the environment. Instead they remain with us, reminding us that they are man-made and that man has apparently failed to consider the environmental consequences. It is this dichotomy which elicits my interest in using plastic as material and subject matter for art.

My attraction to constructivist painting indicates my

fascination with process and tools; plastics bespeak process and contact with technology. While wandering through factories to secure materials for my constructions, I was always fascinated by what I saw, coming away from the experience with new ideas and information concerning the use of materials.

RECENT WORK

In my recent work, I have used clear and tinted vinyl, clear plexiglass, and fabric backed vinyl material to utilize such properties as transparency and flexibility to enclose negative space so that the viewer could see through but not physically participate with the space. I like what the transparent plastic can reveal and the multiplicity of its responses and interactions with the environment. The forms revealed within my plastic boxes, plastic sacks, and plastic enclosures include such things as kodalith photography of structures, inflated yellow balloons, expanded polyurethane foam which bulges and oozes through the seams, and styrofoam pellets which bulge through openings. In the case of the pellets and polyurethane foam, the enclosed material completely fills what might have been the negative space in another relationship.

In several cases forms have included the use of a zipper for various reasons relating to a series of personal experiences. A zipper is a functional and a funny thing. Everyone

uses zippers almost everyday. They keep us cinched in, warn of creeping pounds, permit us to "go to the john," and get stuck maddenly often when dressing or undressing. Besides this, the zipper is a handsome, mechanical device, an ingenious way of joining and attaching parts as well as a potentially useful aspect of design.

My works are joined or hung by the use of mechanical devices, solvent bonding, heat sealing by the use of an iron and aluminium foil, or sewing on a sewing machine. As I find the need, techniques are adapted from industry and other related fields such as printing and photography.

I felt the need to incorporate imagery with my plastic forms--combining the actual and the illusional in order to create new visual relationships. I felt that in order to unify all the parts of several constructions I would have to produce images utilizing either printing techniques or photography. I found that a positive image offset plate worked well and in the process discovered that the kodolith film, used to expose an image on the plate, was as exciting and usable as the plate itself. When this type of image was combined with transparent vinyl, the image had the same plastic presence as the plastic material; it was a natural companion. Using photography has allowed me to record those things in my environment which either excite or disturb me. It provided

me with a storehouse of images and ideas to be drawn upon for new combinations and new statements.

There is a challenge to using many materials and processes requiring craftsmanship and knowledge of techniques. The amount of materials and techniques used doesn't promise automatic significance, and there is a danger in becoming involved with more materials than can be integrated. But knowledge of materials does give a freedom to explore many more possibilities and a chance to render products human.

CONCLUSION

We today are plastics oriented.

Plastics permeate every area of our daily life and have a major role in such fields as packaging, furniture, construction, appliances, clothing, electronics, and art. From heart valves to milk bottles, from inflatable furniture to totally moulded living environments, plastics have been chosen because of superior performance in filling existing needs. Now new dimensions are in sight, with the materials answering demands that could never have been made before. New applications, new designs, new shapes stemming from the limitless versatility of plastics will permit men to meet his environmental needs more precisely.²⁸

The artist cannot handle the complexities of the technology surrounding the use of plastics all by himself--even if he had proper access. It is the challenge of the future to have scientists, engineers, chemists, artists, and designers working together to explore the potential of plastics, thereby modifying and improving our present materials and the uses to which they are put with high regard for individual need, social need, and environmental need.

The times we live in force us to make fundamental changes if we are going to meet the responsibilities in this fast-changing and in many ways threatening modern world. "To oppose technology is to oppose life, for technology is as much a part of man as his home, or his road, or his clothes, in company

Sandra R. Zimmerman, coordinator of exhibition, Plastic as Plastic, catog., New York: The Museum of Contemporary Crafts, 1969.

with all this technology is surely non human, but man alone can render it human."²⁹ It is the challenge of the artist to meet his changing world in ways appropriate to his person.

²⁹Davis, p. 46.

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APPENDIX: SOURCES OF SUPPLIES

Acrylic Sheets, Rods, and Tubes

Cadillac Plastics
295 Buell Road
Rochester, New York

Rohm and Haas Company
1800 Penfield Road
Rochester, New York

Ward's Plastic Center
556 Lyell Avenue
Rochester, New York

Plastic Parts

Mail Order Plastics
58 Lispenard Street
New York, New York

Halkey-Roberts Corporation
37 Spring Valley Road
Paramus, New Jersey
(plastic valves--inflatibles)

Ward's Plastic Center
556 Lyell Avenue
Rochester, New York
(flexible tubing, plastic coated cable)

Polyurethane Foam

Art Foam
Hicksville, New York
(6 p.c.f. foam for sculpting)

Cadillac Plastics
295 Buell Road
Rochester, New York
(foam in aerosol packs)

M-Bex Corporation
1170 Lexington Avenue
Rochester, New York
(rigid foam)

Reichold Chemicals
RCI Building
525 N. Broadway
White Plains, New York
(components in 55 gallon drums)

Dygeet and Stone Inc.
1024 Garson Ave.
Rochester, New York
(packaging and a portable polyurethane foam unit of 0.5 lb.
density)

Spaulding Fiber Company
Tonawanda, New York
(components in 55 gallon drums)

Resins

Berton Plastic Company
Midler Park Drive
East Syracuse, New York

Reinhold Chemicals
RCI Building
525 N. Broadway
White Plains, New York

M-Bex Corporation
1170 Lexington Avenue
Rochester, New York
(casting and embedding)

Sealing

Arrow Plastics--Quality Creations Inc.
1 Mattimore Street
Passaic, New Jersey
(di-electric impulse sealing)

Vertrod Corporation
2037 Utica Avenue
Brooklyn, New York 11234
(portable units made to order--designed units for N.Y.U.)

Solvents

Cadillac Plastics
295 Buell Road
Rochester, New York

Styrofoam Pellets and Raw Materials

Synthec Foam Corporation
350 Whitney Street (right off Lyell Ave.)
Rochester, New York
(Mr. Ray Chapman and Jerry Norsey)
(raw materials and expanded beads)
(plan to move to Ontario, New York)

Vinyl

Cadillac Plastics
295 Buell Road
Rochester, New York

Frankel Brothers and Company
176 Anderson Avenue
Rochester, New York

Lori Fabrics
Henrietta Plaza (Route 15)
Rochester, New York

Howard's Fabric and Foam
519 Ridge Road East
Rochester, New York

Nusbaum's
corner of Clinton Avenue and Abrahams Street
Rochester, New York