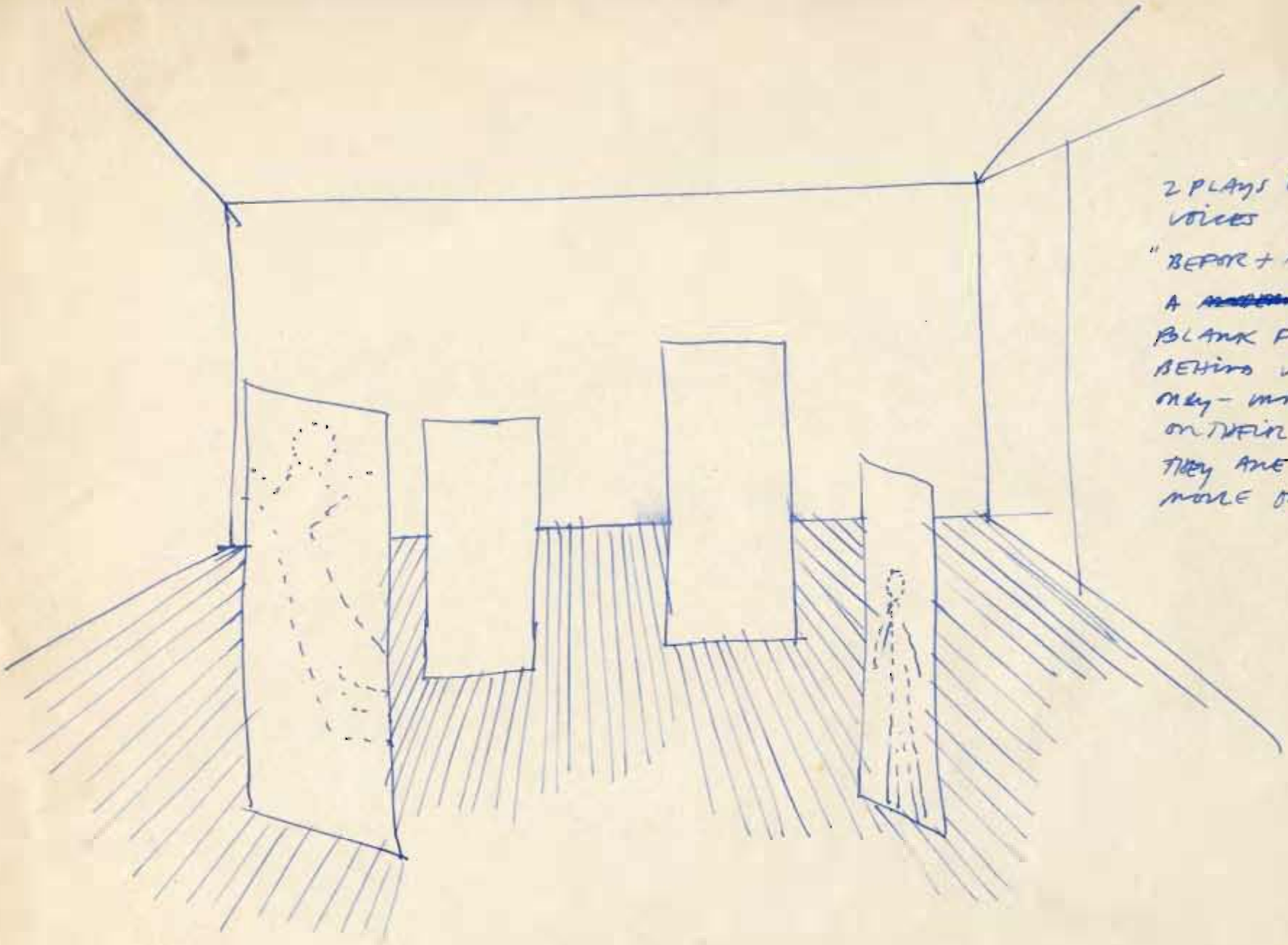
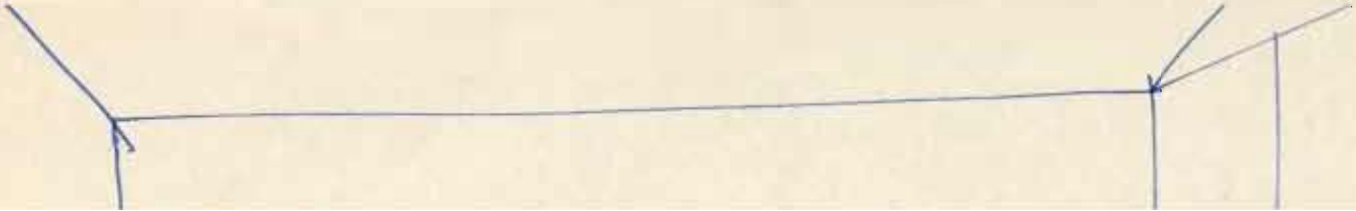


2 PLAYS FOR 4 VOICES

"BEFOR + AFTER."

A ~~[illegible]~~ FAIRY TALE. BLANK FLATS ACTORS BEHIND VOICES HEARD ONLY - IMAGES PROJECTED ON THEIR SCREENS. THEY ARE FREE TO MOVE ON STAGE.



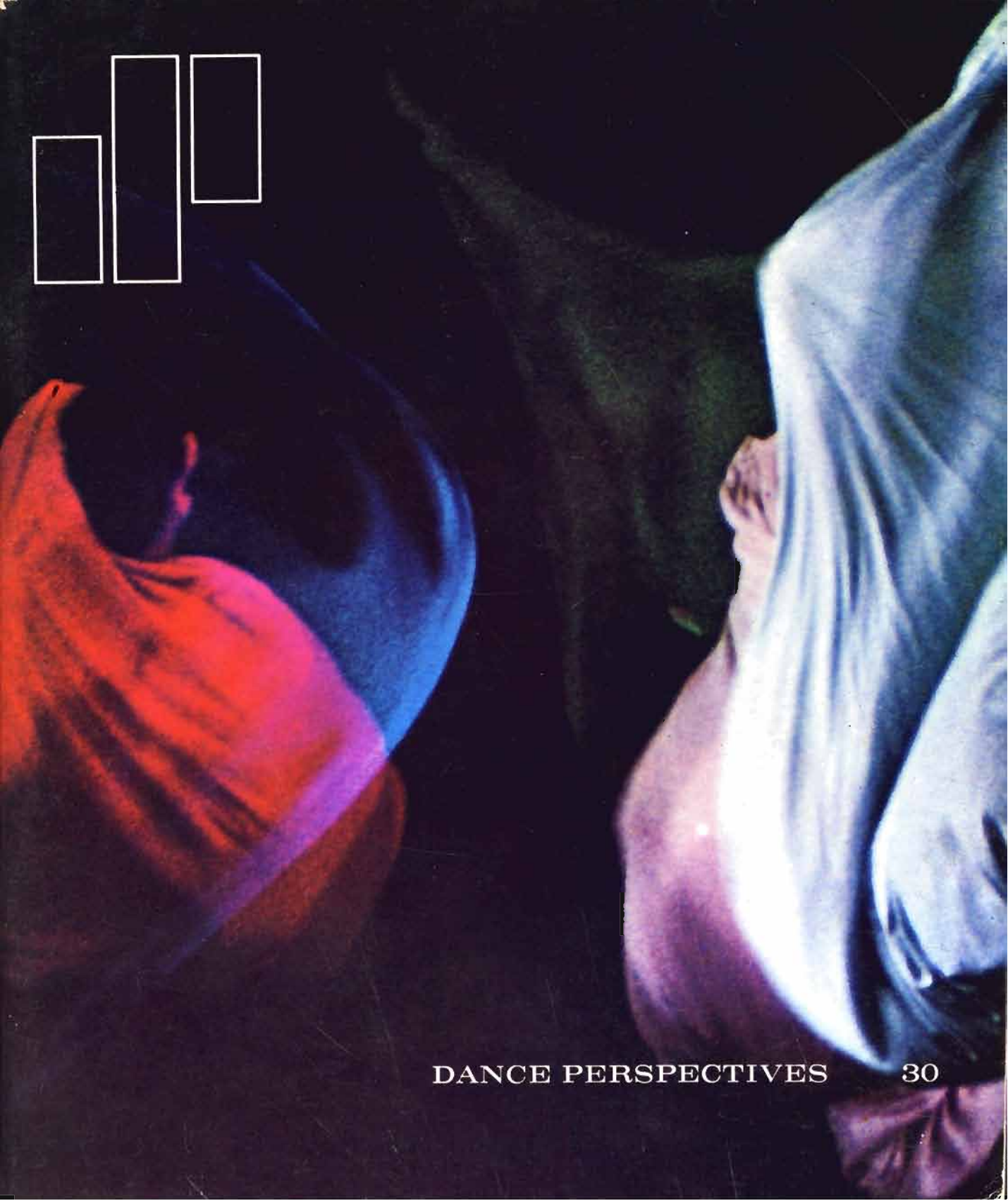
2 PLAYS FOR 4 VOICES

"BEFOR + AFTER."

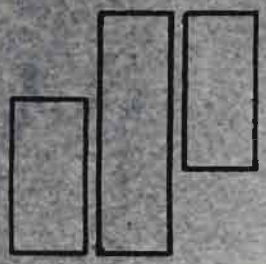
July 1964 performance of *Variations V* Lincoln Center, New York
Yvonne Rainer, left and Merce Cunningham, right

Variations V

Variations V



DANCE PERSPECTIVES 30



DANCE PERSPECTIVES 30 / SUMMER, 1967

SELMA JEANNE COHEN, *editor*

KARL LEABO, *editor and art director*

JOHN MARTIN, *consulting editor*

Published quarterly by Dance Perspectives, Inc., 29 East 9th Street, New York, N.Y. 10003. Subscription: $6.00. Single copies: $2.50.

Library of Congress Catalog Card Number: 67-26897. Copyright 1967 by Dance Perspectives, Inc. Second class postage paid at New York, N.Y.

ACKNOWLEDGMENTS

The editors acknowledge the cooperation of Springs Mills, Inc., in providing illustrations from *Fusion*, produced by Concepts Unlimited for the Springmaid Premiere Collection.

We wish to thank Teiji Ito for the loan of material by the late Maya Deren. All photographs of her work are from his collection. The transcript of Miss Deren's speech to the Creative Film Foundation was made by Sheppard Black. We also thank Otis Cavrell for technical assistance and Allegra Fuller Snyder for editorial consultation on the preparation of this issue.

PHOTO CREDITS

Museum of Modern Art/Film Stills Archive: pages 4, 8, 18, 34, 41, 42, 46. Theatre Collection, The New York Public Library: pages 6, 7, 9, 16. United Artists: page 51.

The drawings by Ed Emshwiller were made especially for this issue. The montage on pages 30-31 was made by Stan VanDerBeek.

ON THE COVERS: *Fusion*. Dance by Alwin Nikolais; film by Ed Emshwiller.

TITLE PAGE: Drawing by Ed Emshwiller.

THIS PAGE: Maya Deren.

CONTENTS

4 Arthur Knight
10 Maya Deren
14 Parker Tyler
16 Sidney Peterson
20 Shirley Clarke
24 Ed Emshwiller
30 Stan VanDerBeek
33 Jonas Mekas
36 Stan Brakhage
40 Len Lye
42 Slavko Vorkapich
44 Hilary Harris
48 Allegra Fuller Snyder

CINE-

DANCE

STAN VANDERBEEK

Light...transparency...shadows
street-light...photo-play...the motion of
man...moving
shaping the form of mankind
in the street
in the symbolic theatre
in the landscape of the mind's dreams
in the theatre of illusions...poetry...
virtual-reality...electric-art...and motion
that envelops
the man in the street
with the illusion of the man in the street
as he sits in a theatre and considers
himself as part of "reality"
cinema and dance-theatre are diagrams
for reality
life-magic-theatre, a means to take the
pieces of experience...and assemble them
into resemblances of life
life...looking...at life
I like to think that
"expanded-cinema" is a unique theatrical tool
for dance-drama-ritual—
opening the walls of the stage-space
with virtual-images, new visions of
scale—and transparencies (the dancer can
determine and design "gravity" for example
in the use of "stills" and with motion pictures
and will be able with laser photo-optics
to "reproduce" himself in 3
dimensional illusion)
theatre then as excerpt...renews
touch...feel...redo...running...turn...look
approximate...invented light...paradox...
mythos...curvilinear perspective...aerial
view...magic...non-gravity...molecular
and macro scale
the stage as a mirror of man
the stage as the body of man
the dancer as a stage

FLY

Peter Saul and Carolyn Brown in Merce Cunningham's Variations V. Film projection by Stan VanDerBeek.

for everyman
in the invented reality of dance
I see a man (dancer) turning
in a clear sight, against the blur
and azmuith-wall of tumbling objects...
artifacts...architecture...history
seeing the world-fragment, now from
400 miles away...now from a television
set...listening radio-minds...
transistorized-century, meet and
meta-act—moving away from word to
buring word more to "act" in the
instant history and "nowness" of dance
(history has become up-to-date-ness
or is forgotten!)
and evolution into visual-language that
moves at the same speed as history!
(seeing into seeing...non-verbal and
instinctive)
reason listens on a hand to mouth
basis with logic and the senses...
and acts to balance out the
mind with the body...
(myth...dream...ethos...homeostasis...)
in the machine...magic...dream-theatre
of light, moving forms dance □

UNIVERSITY OF SOUTHERN CALIFORNIA
SCHOOL OF PERFORMING ARTS
UNIVERSITY PARK
LOS ANGELES, CALIFORNIA 90007

DIVISION OF CINEMA

FROM....Stan VanDerBeek

RE: Project "FEED-BACK"
(mixed -media evant sponsored
by the CINEMA DPT to be pre-
-sented MONDAY EVENING APRIL IO
in HANCOCK HALL .....

The basic plan for the evening will be five separate image events.....
making use of films,slides, video tape,closed circuit tv,perhaps actors
or dancers,FM transmitters...etc.....
All of the material for this evnet will be created in the interval
before April IO by the students of the Cinema Dept and myself.....
these projects include:

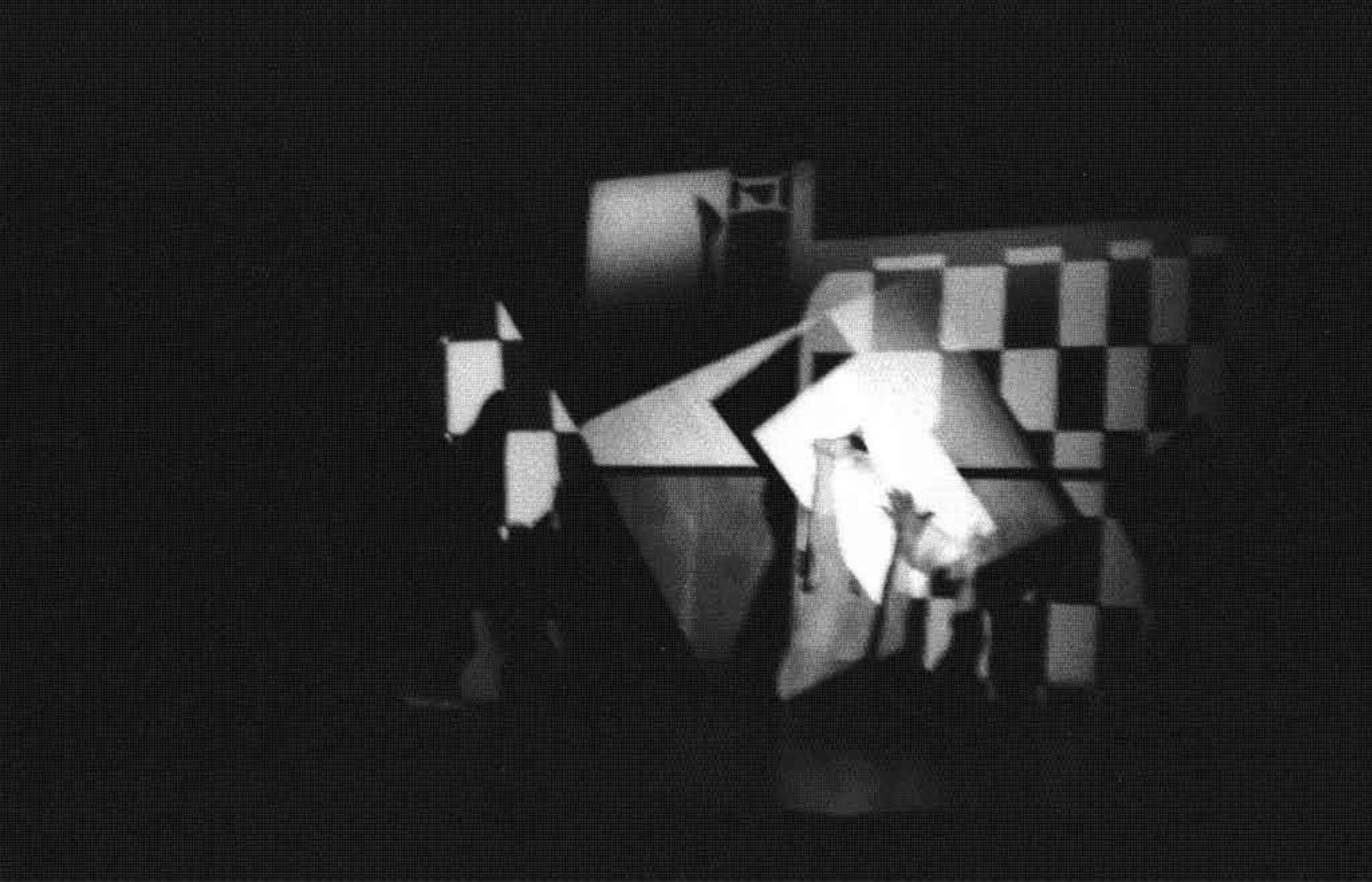
I- "The History of Motion in Motion...."
a 5-IO min film...blk and wht...useing film clips and animation
a sprint through cinema-history from the earlieet footage to I967

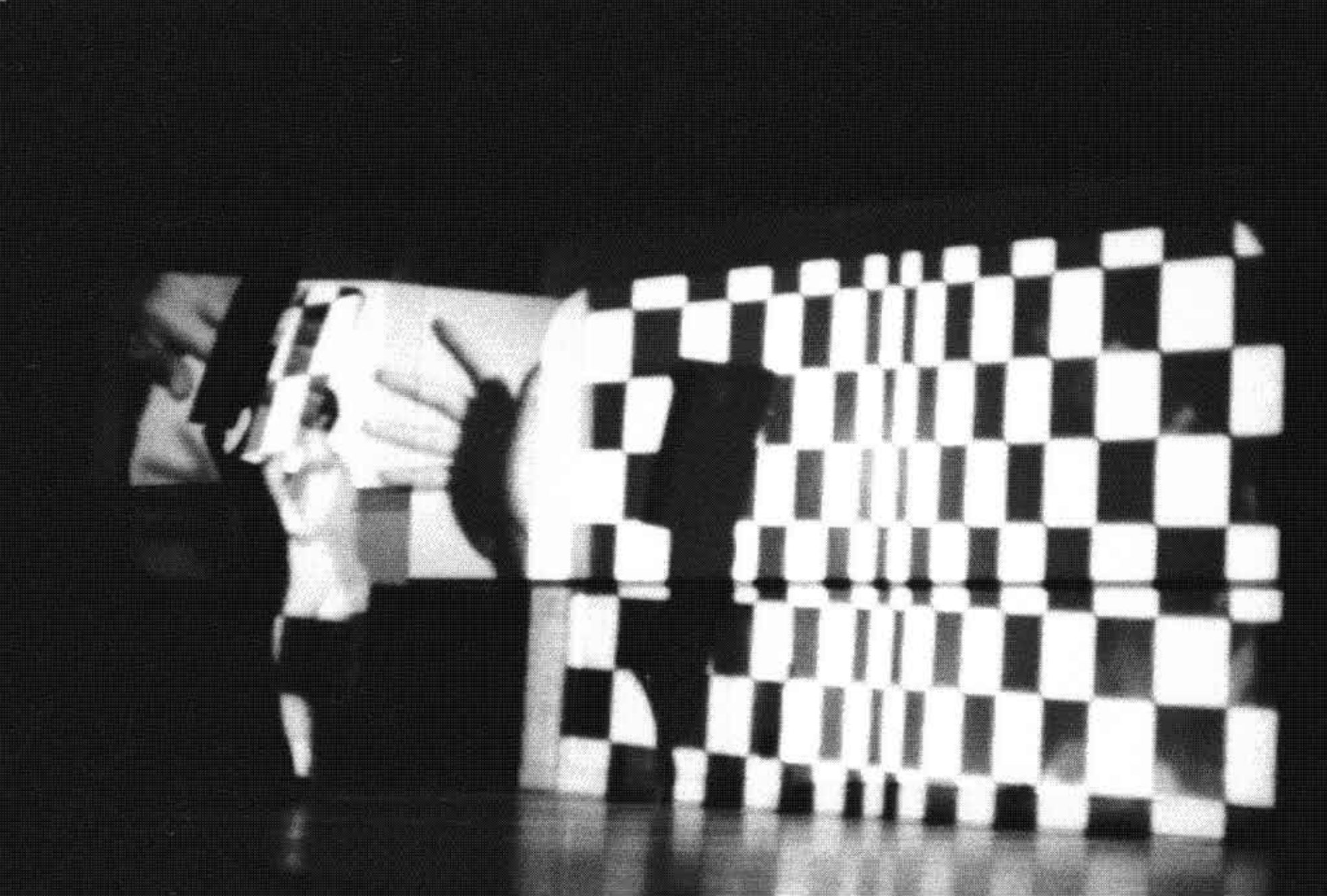
2- "Hyway Culture"
a IO min film-slide-sound event,concerned with the city-scape
envireement....

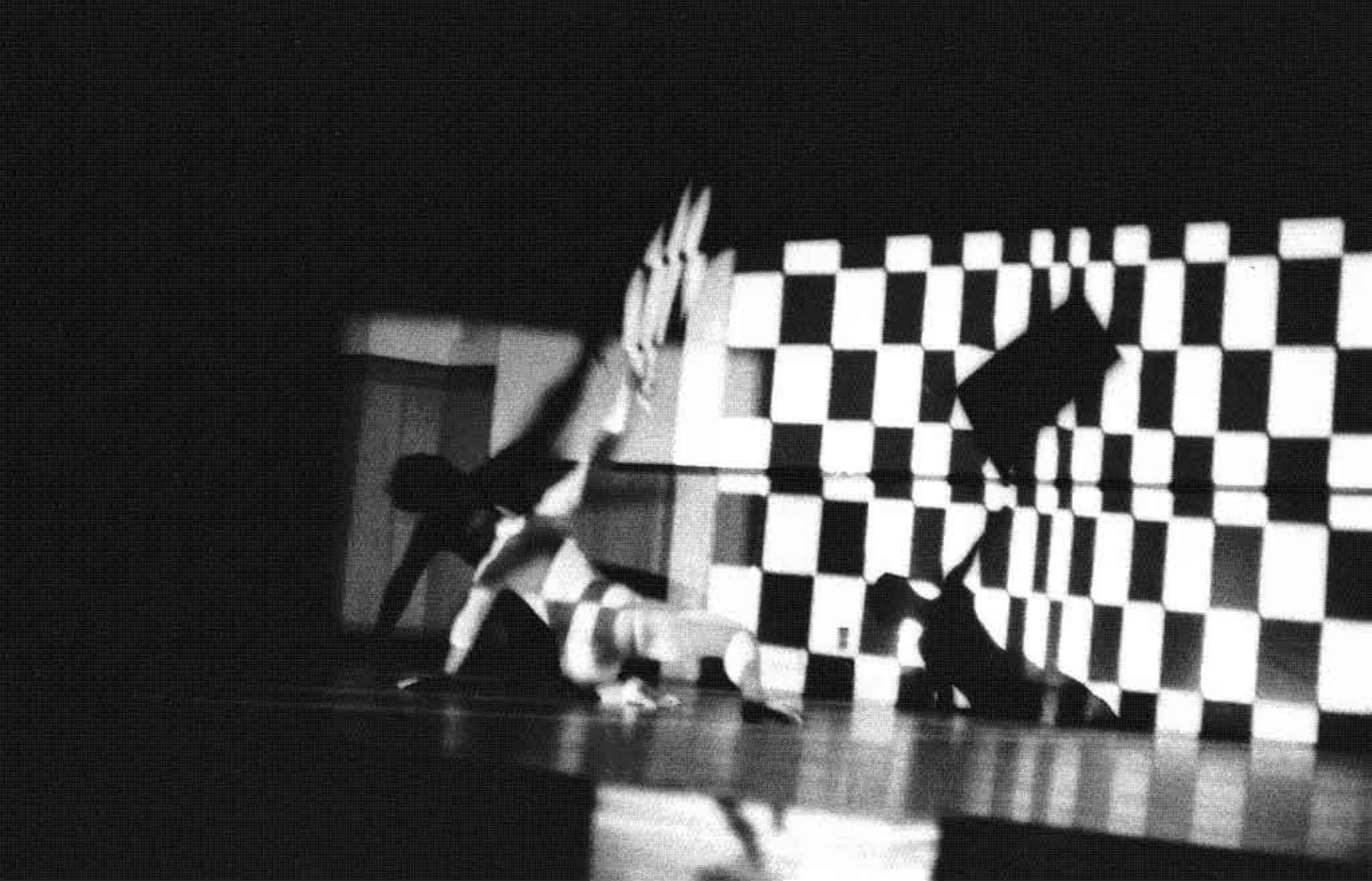
3- "HE...SHE...IT"
a IO min film,three screens with slides and other visuals....
a study of men,women and objects....

4- "A Study in Form"
a I5 min study with video-tape facilities,film,slides and other
image produceing devices....(a three projector "colororgan" perhaps)
kineoscope or video projectors.....(special labratory experiments
with solarization..and printing will be attempted...)

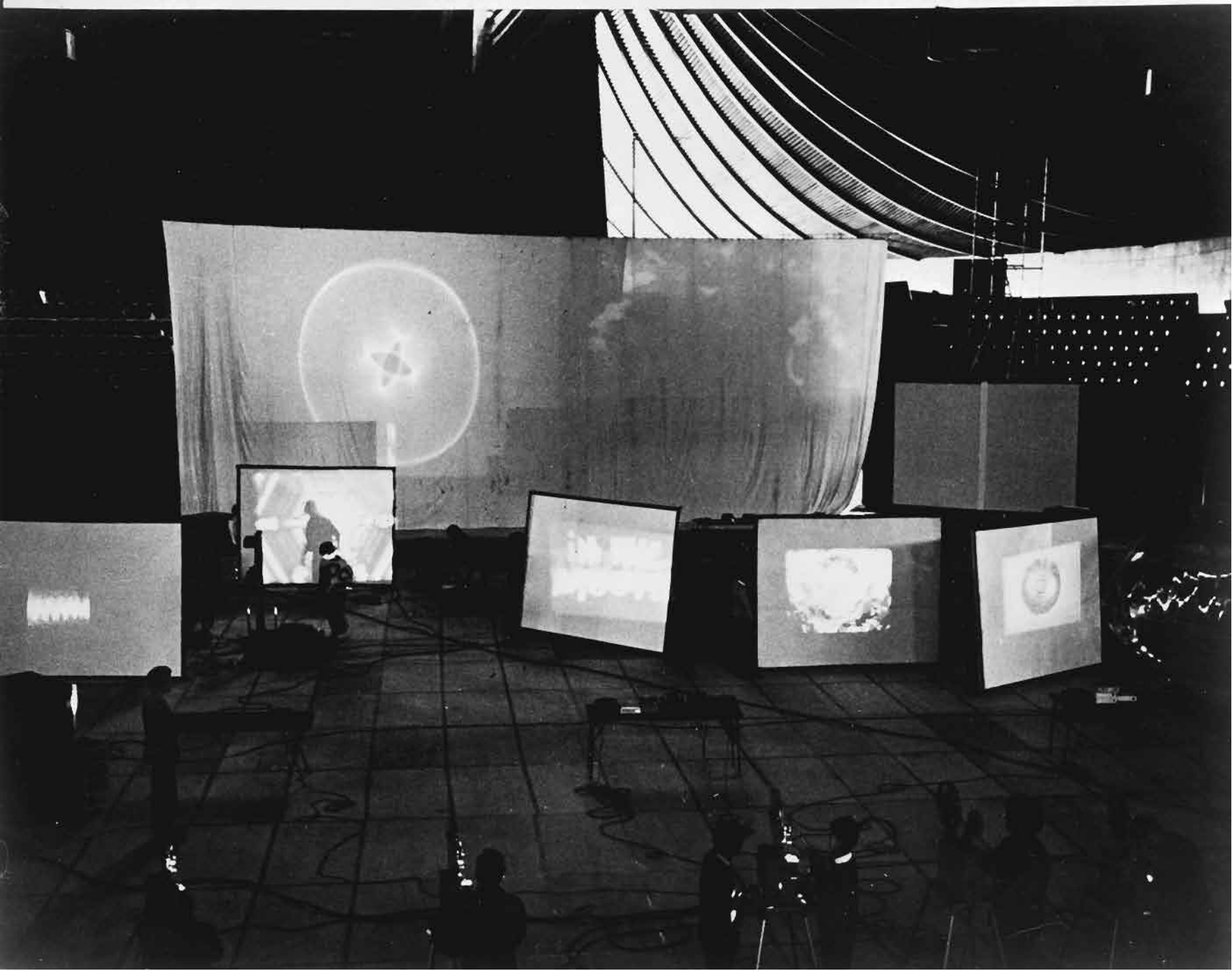
5- "VIolence Sonata"
a 5 min film,three screen and slides,a study in dramatic form (actors)
and newsreels.....



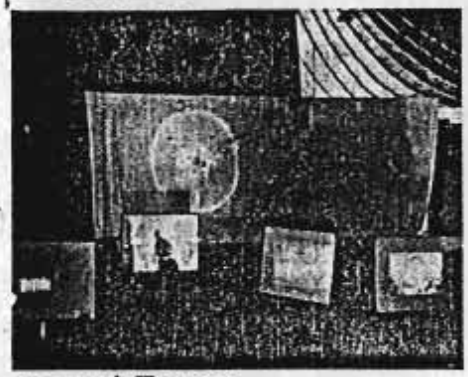




Stan VanDerBeek's "Found Forms", a multiprojection film performance at Intermedia Festival, Tokyo '69



Down Memory Lane



Found Forms

Daryl Chin

Stan VanDerBeek Retrospective
Anthology Film Archives

Stan VanDerBeek was one of the exemplars of the avant-garde of the Sixties; along with such others as Aldo Tambellini, Gerd Stern and the USCO Group, Roberts Blossom, VanDerBeek was a name to conjure when the reference was made about "the Expanded Cinema." The recent retrospective at Anthology Film Archives (January 7-9, 1977) was, in many ways, a nostalgic event, an occasion for historic consideration, a trip down memory lane reaching to the present.

It's almost impossible to write about VanDerBeek without recourse to that recent history which provides the context for his work. The problems posed have to do with the deliberation of expectation: how can I explain the circumstances surrounding my previous encounters of VanDerBeek's work? Attendance at a VanDerBeek event entailed anticipations of a different order than those involved in contemporary events. That is to state that those who schlepped to those out-of-the-way places like the Charles Theater, Tambellini's Gate, and the everchanging Filmmakers Cinematheque (analogous to, and sometimes overlapping with, those who, in terms of other artforms, schlepped to the Judson Church or the Cafe Cino) had a definite idea as to why they were going, but it was quite a different idea than that held by contemporary audiences. I think it's safe to state that those who went didn't expect to see smooth and finished and sedate art. They went (I can only speak for myself, of course, but I don't think I was alone in this) with an almost supercharged thrill.

You never knew what you would see, you never knew what would happen, you never knew what you would experience. It could be stylistically proficient, with a high professional gloss, like the dances of Lucinda Childs; it could be wildly disjunctive, with a rough, hectic, messy texture, like the happenings of Al Hansen. But it was always a risk, a bet, a dare.

The works which VanDerBeek showed (19 films and videotapes in three programs) represent only a fraction of his output. The idea of the artist as an inventor is particularly apt in the case of VanDerBeek: he's moved in so many areas that it's difficult to keep track, let alone categorize. From collage animations to computer graphics, from film to video, from singlescreen works to complex multimedia environments, VanDerBeek has rushed in where others didn't even know there was an area to tread. And he's accomplished an impressive body of work while sojourning along the path of Expanded Cinema (expanded, by the way, to include Video).

The first program represented the years 1957 through 1963, and included seven films: *What Who How; Breathdeath; Science Friction; VanDerBeekiana; Skullduggery; Snapshots of the City; Spherical Space.* The first three films are collage animations with sharp, rapid, staccato cutting, colliding juxtapositions, and satirical lancing, surreal images. These films retain an enormous vitality, a bounding inventiveness, an incendiary wit which was shared by such other film collagists as Robert Breer, Bruce Conner and Dick Preston.

VanDerBeekiana is a documentary on VanDerBeek: three films are included in the documentary (*See, Saw, Seems; Image After Image; Poem Field Number 1*) as well as an interview about the Movie-dome.

The Movie-dome was one of the central projects in VanDerBeek's career: It was a specially designed theater which VanDerBeek spent ten years developing. VanDerBeek was attempting to create an environment for his aesthetic synthesis of film, performance, dance. The Movie-dome was constructed from a silo: it was a huge dome which encased the viewers, who were requested to lie down around the perimeter. As many as thirty images would get projected all around, enveloping, surrounding, engulfing the viewers. *VanDerBeekiana* is like a time capsule from the mid-Sixties.

Skullduggery is a collage film derived from newsreel footage, with a decidedly pointed political commentary. *Snapshots of the City* is a film deriving from a happening by Claes Oldenburg, and establishes VanDerBeek's affinities with other artists working in "Expanded Arts" (happenings, events, intermedia, dance, music) at that time. *Spherical Space* continues that collaborative venture, in this case, with Elaine Summers, a Judson Dance Theater member noted for her work in intermedia (*Country Houses, Fantastic Gardens, Theater Piece for Chairs and Ladders*).

The second program in the Stan VanDerBeek retrospective covered the years from 1964 through 1972, when video gained an ascendancy in the filmmaker's work. The films shown (*Panels for the Walls of the World; Videospace; Moirage; Newsreel of Dreams; Computer Generation; Dance Works;* another version of *Newsreel of Dreams*) demonstrate the enormous appetite VanDerBeek has for new technologies, new tools, new techniques.

Computer Generation, another documentary on VanDerBeek, was made while he was artist-in-residence at M.I.T., working with Ken Knowlton and other engineers on the Imlac Computer, displaying the possibilities of computer-derived animation.

Newsreel of Dreams, a two-screen film work, uses video imagery of a pop culture nature. It's another film collage, only this time employing the sophisticated techniques of video (synthesizing, cuing, superimposing) to distort, compound, dissolve image upon (over, under,around) image. The later version of *Newsreel of Dreams* shown was quite different: it was

Continued on

a video-synthesizer film with live-action intercut, juxtaposed, superimposed over a complex field of shifting colors and forms. The imagery is slow, drifting, trancelike.

Film) and video works shown on the Advent Projector (*Moaning Lisa; Newsreel of Dreams*). Furthering his interest in technology, VanDerBeek has been de-

temporary events. That is to state that those who schlepped to those out-of-the-way places like the Charles Theater, Tambellini's Gate, and the everchanging Filmmakers Cinematheque (analogous to, and sometimes overlapping with, those who, in terms of other artforms, schlepped to the Judson Church or the Cafe Cino) had a

permutations by means of a video synthesizer. The definition of an archetype and its capacity for the incorporation of suggestions, resonances, comparisons,

The first program represented the years 1957 through 1963, and included seven films: *What Who How; Breathdeath; Science Friction; VanDerBeekiana; Skullduggery; Snapshots of the City; Spherical Space.* The first three films are collage animations with sharp, rapid, staccato cutting, colliding juxtapositions, and

work: the state of viewing becomes equated with the state of dreaming, an equation which occurred to VanDerBeek during the experience of the Movie-dome. That mode

music) at that time. *Spherical Space* continues that collaborative venture, in this case, with Elaine Summers, a Judson Dance Theater member noted for her work in intermedia (*Country Houses, Fantastic Gardens, Theater Piece for Chairs and Ladders*).

The second program in the Stan Van-

March 22, 1969

Over the past ten years, I have been working with a variety of media, starting with painting and graphics, polarized light, constructions (heat paintings, collages, etc...) developing an interest in motion pictures in 1957 I began work in animation...painting, stroke by stroke, animation: frame by frame...computers, on and off...and bit-by bit...the sequence is inevitable; motion pictures as graphics in motion...computers came to my attention in 1965 with some of the graphic possibilities. I looked on the computer as a challenge..(a large black box, the memory of the world, a metaphysical printing press...) I was fortunate to meet Peter Neuman, a programer who helped me meet other people working in scientific research with computers....gradually with the help of Carol Bosche and Ken Knowlton I was tutored in programing and began to work in the area of computer generated animation...I consider the computer-logic systems and process of image making; a fast, high speed car, that is difficult to learn how to drive..and like fast turns is somewhat dangerous and unpredictable...however, in time-speed-memory-ideas and forms, it is breathtaking...I expect driving a computer down the road of art and sensibilities, will lead to flying: ie: analog systems... and that will be very lovely and full of surprizes that defy gravity and expected images...my own perspective as an artist and my instincts tell me that memory is the matrix of the human of the human condition, and computers are the pertinent extension of the real-time-mind of man...hooray for art and life...

light...motion...time...cinema measure...motion pictures as a time machine...as an experience machine

Woodrow Wilson is reported to have said upon seeing D
speed-memory-ideas and forms, it is breathtaking...I expect driving a computer down the road of art and sensibilities, will lead to flying: ie: analog systems... and that will be very lovely and full of surprizes that defy gravity and expected images...my own perspective as an artist and my instincts tell me that memory is the matrix of the human of the human condition, and computers are the pertinent extension of the real-time-mind of man...hooray for art and life...

light...motion...time...cinema measure...motion pictures

there are now more T.V. sets in America than bathtubs. There are more radios in America than people. Although 75% of the Japanese households have television sets, statistics show only 35% have running water and fewer than 10% have flush sanitation. Some 40% of the American children have one or more meals at the T.V. set...Television reaches all but 3% of the American people(and this is a statistic taken from 1962). In June, 1967, the first international satelite T.V. show with hookups in 26 nations was broadcast "live".

"so many of the artists became unhappy about this eternal, unyielding quality in their art, and they began to wish their work were more like shoes, more temporary, more human, more able to admit of the possibility of change. The fixed, finished work began to be supplemented by the idea of a work as a process, constantly becoming something else, tentative, allowing more than one interpretation." Dick Higgins, April 1966

we are now going through a reordering of our visual semantics...outlook..insight and information absorbing process...instant electric libraries

teaching as a "performance"..the theatre of "life" motion pictures as an experience machine...a possible way to replace "war" games with "peace" games

In the present media-mix, man as a metaphor...does not recognize man...weare entering an era of "approximate art" (note here the word "happening" has entered our life, a word-symbol standing for a series of events, about which the outcome is not predictable...the experiment that often ends up as a disposable work of art..)

it is very important that art and life...interact and keep the social process self-conscious. We are entering an era of disposable art...synthetic media and artificial intelligence...social consciousness without decisions... (Levittown...) social decisions without consciousness... (Detroit and Newark riots).

In the present media-mix, man as a metaphor...does not recognize man...weare entering an era of "approximate art" (note here the word "happening" has entered our life, a word-symbol standing for a series of events, about which the outcome is not predictable...the experiment that often ends up as a disposable work of art..)

it is very important that art and life...interact and keep the social process self-conscious. We are entering an era of disposable art...synthetic media and artificial

artificial intelligence and the rise of the computer... (the computer has been with us approximately 15 years... only this year has it equalled and passed the human brain's capacity for decision making...something over the order of 100,000 decisions a second...)

computers which will take over more of our conscious decisions..will completely change our information procession,making us less but giving us more "decision energy"

how will we make use of this new and extra decision energy,spare time, and graphic possibilities...???it should make for the flowering of a mass, personal art, instant culture and incredibly subtle feedback situations.. inter-play techniques for man and machine...man-machine-diadialogue...a culture-intercom...

a flowering of a new technological art...a direction America is going anyway..(6% of the world's population has 50% of the world's phones..)

this growing technology will produce new forms, not only motion pictures, to help us in the externalization of things..to help us overcome our visual illiteracy... (picture language is one way to break through the world-wide problem of over 7oo million people who can't read or write) motion pictures,if nothing else, help us to re-experience our experiences

and the interesting problem here is that we are each of us unique in our needs and our interpretation of "experience" either in synthetic motion picture time, or in "real" time, in private life, or public relations: the problem of the interpretive "symbol"

In Africa, the story goes, the American movies are so old and scratched, that the natives think it is always raining in America.

re-experience our experiences

and the interesting problem here is that we are each of us unique in our needs and our interpretation of "experience" either in synthetic motion picture time, or in "real" time, in private life, or public relations: the problem of the interpretive "symbol"

In Africa, the story goes, the American movies are so old and scratched, that the natives think it is always

opment of a long-range communications system, using light waves. Many obstacles need to be overcome first, but the laser's unique properties, including highly directional, coherent,monochromatic light and its extremely wide frequency range, make this use particularly promising. Lasers may one day provide us with instant interplanetary television. (Reported in Scientific American)

"We are confronted with a great scrap heap of words and misused symbols and next to it an immense storehouse bursting with new discoveries, inventions and potentialities, all promising a better life," comments Siegfried Giedion in Mechanization Takes Command. He goes on to say,"Never has mankind possessed so many instruments...But the promises of a better life have not been kept. All we have to show so far is a rather disquieting inability to organize the world, or even to organize ourselves. Future generations will perhaps designate this period as one of mechanized barbarism,the most repulsive barbarism of all."

"I think of art, at its most significant, as a DEW line, a Distant Early Warning system that can always be relied on to tell the old culture what is beginning to happen to it." Marshall McLuhan "Understanding Media"

It is quite possible that the next great age of science will be dedicated not to the study of the "outer" world of nature, nor to the "inner" world of the psyche, but to an exhaustive examination of those processes that take place at the interface between the biological/neural imprints and the stimuli that constantly bombard them.

This new science-we might callit "the third science"- may come up with a working field theory of a man/world "hyphenation," just as our contemporary physics has expressed the equivalence of mass and energy and space/time and as psychology has come up with the mind/body concept. We are beginning to move into the world of hyphens;holes that may lead us to other spheres. We may find, in this third science we have postulated, that there is no meaningful distinction between the world and man, except as thinking makes it so. (This is, interestingly enough, the philosophic basis of Eastern religions which find, in the eternality of man through successive reincarnations, considerable kinship with the theory in modern physics of the conservation of energy.)

The cost of one modern heavy bomber is this: a brick school
"hyphenation," just as our contemporary physics has expressed the equivalence of mass and energy and space/time and as psychology has come up with the mind/body concept. We are beginning to move into the world of hyphens;holes that may lead us to other spheres. We may find, in this third science we have postulated, that there is no meaningful distinction between the world and man, except as thinking makes it so. (This is, interestingly enough, the philosophic basis of Eastern religions which find, in the eternality of man through successive reincarnations, considerable kinship with the theory in modern physics of the conservation of energy.)

General Eisenhower, New York Times, April 17, 1953

"All men are more alike than different. They all have the same long evolution & genetic organization & physical structure, the same neural circuitry, the same kind of brain, the same chemistry, the same needs and desires, the same sensory equipment. We all have more experience in common than otherwise. The same language (way of thinking), the same general childhood history, the same kind of education. We've done the same things, read the same things, heard said eaten touched felt endured suffered craved enjoyed known all the same things, all of us. The differences are almost insignificant, no other race could easily detect them, & they startle us because similarities are invisible.

"Among artificial memory devices the most efficient is the photographic emulsion. Not only can it pack a great deal of information into a small area, but each spot is capable of recording about 10 distinguishable levels of intensity. Microfilm in particular is a vvery effective means of storing printed or pictorial information. Ultimately, every man may have on microcards a library as large as he likes... "If translated to binary code and recorded as black and white spots on film, all of the words in all the books of the Library of Congress could be stored in a cubic yard." Gilbert King "What is Information/"

As John von Neumann explains it,"...the message system used in the nervous system...is of an essentially statistical character. In other words, what matters are not the precise positions of definite markers, digits, but the statistical characteristic of their occurrence."

"The brain cipher," says Grey Walter in "An imitation of Life," is even simpler than Morse code; it uses only dots, the number of which per second conveys all information. Communication engineers call this system 'pulse-frequency modulation.' It was 'invented' by animals many millions of years ago...The engineers who have designed our great computing machines adopted this system without realizing that they were copying their own brains...

The modern digital computer is an infinite telegraph sa-
precise positions of definite markers, digits, but the statistical characteristic of their occurrence."

"The brain cipher," says Grey Walter in "An imitation of Life," is even simpler than Morse code; it uses only dots, the number of which per second conveys all information. Communication engineers call this system 'pulse-frequency modulation.' It was 'invented' by animals many millions of years ago...The engineers who have designed our great computing machines adopted this system without realizing that they were copying their own brains...

"The computer," writes Dr. Jerome B. Wiesner, Dean of Science at M.I.T.,in the New York Times,"with its promise of a million-fold increase in man's capacity to handle information, will undoubtedly have the most far-reaching social consequences of any contemporary technical development. The potential for good in the computer, and the danger inherent in its misuse,exceed out ability to imagine.."

"In just ten years, the typical electronic data processor has become ten times smaller, 100 times faster, and 1,000 times less expensive to operate. These trends will continue, and our national computing power, which is doubling every year, will soon be sufficient to make the computer a genuinely universal tool.

"In 1956, there were fewer than 1,000 computers in the United States. Today there are 30,000, or more than $11 billion worth: and by 1976 the machine population may reach 100,000. And these figures will, of course, be greatly increased through the growth of data processing in other nations.

"A decade ago, our machines were capable of 12 billion computations per hour; today, they can do more than 20 trillion; and by 1976-a decade from now-they will attain 400 trillion-or about two billion computations per hour for every man woman and child. Quite evidently, the threshold of the computer age has barely been crossed." (General David Sarnoff)

I do not know what sort of world science and technology will give us in the future, though I sometimes try to envision it. Whatever world science gives us, that is the world in which art will have to be created and enjoyed. If the world of the future is a world of ephemeral TV programs and houses which we change as often as we change cars, it may be a world which calls for an art as ephemeral as much of the music which eighteenth century composers provided for social occasions. Art is more than eternal masterpieces. Art must thrive in the real lives of people, not in a vanished past or a nebulous future.

If art is to show to best advantage in a real present and a real future, it must be opportunistic in using what it can of the knowledge provided by science and the tools provided by technology.

"Formerly, we had boundaries between the arts, and you could say then, if you are saying what I am saying now, that the best criticism of a poem is a poem. Now, we have such a marvelous loss of boundaries that your criticism of a happen-

eighteenth century composers provided for social occasions. Art is more than eternal masterpieces. Art must thrive in the real lives of people, not in a vanished past or a nebulous future.

If art is to show to best advantage in a real present and a real future, it must be opportunistic in using what it can of the knowledge provided by science and the tools provided by technology.

"Formerly, we had boundaries between the arts, and you

seem to change what I do. What I do changes what I do. What artists do changes what I do." (John Cage)

"In the last ten years we have wasted 25,000,000 man-years of potential economic production because of mass unemployment. An hour of human labor is the most perishable economic value in the world. A ton of steel can be made in 1961 and put in a warehouse. If it is properly oiled and kept coveeed, it can be consumed in 1964....But an hour of human labor cannot be stored...
We have poured down the economic drain $600 billion in our potential gross national product which we could have created if we had had full employment and full production and an adequate rate of economic growth during the past ten years."
Walter Reuther "First Things First"

"Automation is information," says Marshall McLuhan (in Understanding Media), "and it not only ends jobs in the world of work, it ends subjects in the world of learning. It does not end the world of learning. The future of work consists of learning a living (rather than earning a living) in the automation age...As the age of information demands the simultaneous use of all our faculties, we discover that we are most at leisure when we are most intensely involved, very much as with the artists in all ages."

The outer world of Dr. Fernandez-Moran covers a good deal of the glove and extends beyond into outer space. He has been a pioneer in creating educational opportunities in his native Venezuela. Under a space-agency contract, he is developing a portable microscope for Project Apollo astronauts. It is not designed to let them see microbes on the moon, but to read out miniaturized engineering documents and charts in an information storage and retrieval system he has designed.

By revising the microscope in his laboratory, the scientist can reduce 25 printed pages, each 8½ by 11 inches, to fit in a space no larger than a typewriter period. In this manner, the Apollo spacecraft's voluminous engineering manual can be reduced to the size of a glass slide and read with a microscope. The system saves weight and space.

With such slides in his pocket and the portable microscope in his boot, where it is designed to be carried, the astronaut can take a whole library to the moon, including all the engineering and navigation documents that pertain to the mission.

It is not designed to let them see microbes on the moon, but to read out miniaturized engineering documents and charts in an information storage and retrieval system he has designed.

By revising the microscope in his laboratory, the scientist can reduce 25 printed pages, each 8½ by 11 inches, to fit in a space no larger than a typewriter period. In this manner, the Apollo spacecraft's voluminous engineering manual can be reduced to the size of a glass slide and read with a microscope. The system saves weight and space.

With such slides in his pocket and the portable microscope in his boot, where it is designed to be carried, the astronaut can take a whole library to the moon, including all

int arrangement in synagogues. Indians have known it for ages: life's a dance, a play, illusion. Lila. Maya. Twentieth-century art's opened our eyes. Now music's opened our ears. Theatre? Just notice what's around. (If what you want in India is an audience, Gita Sarabhai told me, all you need is one or two people. 2. He said: Listening to your music I find it provokes me. What should I do to enjoy it? Answer: There are many ways to help you. I'd give you a lift, for instance, if you were going in my direction, but the last thing I'd do would be to tell you how to use your own aesthetic faculties. (You see? We're unemployed. If not yet, 'soon again 'twill be'. We have nothing to do. So what shall we do? Sit in an audience? Write criticism? Be creative?) We used to have the artist up on a pedestal. Now he's no more extraordinary than we are.

An electronic microfilm recorder can plot points and draw lines a million times faster than a human draftsman. This machine and the electronic computer which controls it thus make feasible some kinds of moview which heretofore would have been prohibitively intricate, time-consuming, and expensive to draw and film.

The microfilm recorder consists essentially of a display tube and a camera, and it understands only simple instructions such as those for advancing the film, displaying a spot or alphabetic character at specified coordinates, or drawing a straight line from one point to another. Though this repertoire is simple, the machine can compose complicated pictures or series of pictures from a large number of basic elements; it can draw 10,000 to 100,000 points, lines, or characters per second.

This film-exposing device is therefore fast enough to turn out, in a matter of seconds, a television-quality image consisting of a fine mosaic of closely spaced spots, or fast enough to produce simple line drawings at rates of several frames per second.

We become more aware of this uniqueness of organized and organizing principle in the universe, in science. The long held myth that science wrests order out of chaos is fast disappearing in due ratio to the extent that all great scientists have found the universe to exhibit an a priori orderliness. All the various specialities are discovering that their variously remote studies which seemingly 'ordered' local aspects of nature are converging within progressively simpler and more comprehensive patterns. The 'ordering is coming together. When we refer to the computer and auto-[illegible] we refer really to man's externalization

enough to produce simple line drawings at rates of several frames per second.

We become more aware of this uniqueness of organized and organizing principle in the universe, in science. The long held myth that science wrests order out of chaos is fast disappearing in due ratio to the extent that all great scientists have found the universe to exhibit an a priori orderliness. All the various specialities are discovering that their variously remote studies which seemingly 'ordered' local aspects of nature are converging within progressively

In general, much of our present computer usage simply regards the machine as a superfast and efficient clerical assistant. The real trend, however, is, on the one hand, towards a closer individual/computer rapport so that it becomes a generalized intelligence amplifier, and on the other, towards specific types of computer systems to assume the routine operation and maintenance of all the basic physical metabolism of human society.
The architect, planner and other professional may now work closely with the computer without the need to spell out, step by step, programmes in advance. He may talk to the machine directly during processing, view compiled output at any stage and further manipulate data in many alternative forms. The architect is now reinstated in his prime creative role. Instead of his remaining merely the coordinator of various specialists-in structure, lightning, air-conditioning-these may be encapsulated in memory units to be drawn upon as required. This man/computer symbiosis is now developed to the point where the machine also instructs its user and indicates possibilities for closer interaction. You don't have to read the manual but may consult the machine directly with the order, 'I want to do something, instruct me.' This mode of working may now be carried on at a distance with remotely linked viewing and operating consoles and, at the present developmental rates, it will obviously reach the portable, possibly 'clip on' stage before long. Micro-control components are, as we have seen, now availabe in many forms, and computer memories become progressively smaller in volume and larger in bulk storage - capacities. There would be, of course, no need to carry such memory units, but more feasibly, to have call-up linkages to many types of such central libraries.

The arts are often suggested as alternative areas in defining the idge of change in society. But, as traditionally regarded, they are no longer a canonical form of communication in society. The visionary poetry of our period or its symphonic equivalent is as likely to be found on TV, or in the annual report of an aerospace company, as in the book, art gallery or concert hall. The future of art seems no longer to lie with the creation of enduring masterpieces, but with defining alternative cultural strategies. But in destroying the formal divisions between art forms, and in their casual moves from one expressive medium to another, individual artists do continue to demonstrate new attitudes towards art and life. As art and non art become more interchangeable, and the masterwork may be a reel of punched or magnetized tape, the artist defines art less through any intrinsic value of the art object than by furnishing new concepts of life style.

the idge of change in society. But, as traditionally regarded, they are no longer a canonical form of communication in society. The visionary poetry of our period or its symphonic equivalent is as likely to be found on TV, or in the annual report of an aerospace company, as in the book, art gallery or concert hall. The future of art seems no longer to lie with the creation of enduring masterpieces, but with defining alternative cultural strategies. But in destroying the formal divisions between art forms, and in their casual moves from one expressive medium to another, individual artists do continue to demonstrate new attitudes towards art and life. As art and non art become more interchangeable, and

My wife is tired of washing dishes and demands edible plates. I want soluble houses and the astronauts are recycling their urine and sweat for drinking water.

The mind is a computer not railroad tracks.

If you can conceive it you can build it.

Perception is conception.

Form-maker

Token-totems-symbols-as things <u>are</u> things

~~In~~general, much of our present

The architect, planner and other professional may now work closely with the computer without the need to spell out, step by step, programmes in advance. He may talk to the machine directly during processing, view compiled output at any stage and further manipulate data in many alternative forms. The architect is now reinstated in his prime creative role. Instead of his remaining merely the coordinator of various specialists-in structure, lightning, airconditioning-these may be encapsulated in memory units to be drawn upon as required. This man/computer symbiosis is now developed to the point where the machine also instructs its user and indicated possibilities for closer interaction. You don't have to read the manual but may consult the machine directly with the order, ' I want to do something, instruct me.' This mode of working may now be carried on at a distance with remotely linked viewing and operating consoles and, at present developmental rates, it will obviously reach the portable, possibly 'clip on' stage before long. Micro-control components are, as we have seen, now available in many forms, and computer memories become progressively smaller in volume and larger in bulk storage capacities. There would be, of course, no need to carry such memory units, but more feasibly, to have call-up linkages to many types of such central libraries.

carried on at a distance with remotely linked viewing and operating consoles and, at present developmental rates, it will obviously reach the portable, possibly 'clip on' stage before long. Micro-control components are, as we have seen, now available in many forms, and computer memories become progressively smaller in volume and larger in bulk storage capacities. There would be, of course, no need to carry such memory units, but more feasibly, to have call-up linkages to many types of such central libraries.