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The Museum of Modern Art
11 West 53 Street, New York, N.Y. 10019 Tel. 245-3200 Cable: Modernart

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The story of how artists of this century have looked upon and interpreted machines in attitudes ranging from devotion and even idolatry to deepest pessimism and despair is the subject of an exhibition of more than 200 works of art and related objects on view at The Museum of Modern Art from November 27 through February 9. The Machine as Seen at the End of the Mechanical Age was directed by K. G. Pontus Hultén, Director of Moderna Museet, Stockholm, who is also the author of the accompanying catalog bound in tin-can steel*.

Since the beginning of the mechanical age, some people have looked to machines to bring about progress toward Utopia; others have feared them as the enemies of humanistic values, leading only to destruction, Mr. Hultén observes. Most of these contradictory ideas persist, in one form or another, in the 20th century and find their reflection in art. This is evidenced in the exhibition in the works of art varying in character from the conventional mediums of painting, sculpture, drawings, prints, photographs and films to motorized constructions and computer graphics. Also included are two kinds of functional mechanisms - the automobile and the camera. Many works enlist the participation of the spectator, such as Jean Tinguely's Metamatic No. 8, an art-producing machine with which visitors can make their own watercolors, and his Rotozaza, which ridicules the practical side of the producing machine and the economics of overproduction by eating up its own output - balls - when the visitor tosses them back into the machine.

Other works selected include paintings of speeding automobiles by the Futurists, Duchamp's The Bride, described as a well-oiled machine running on "love gasoline,"

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*THE MACHINE - AS SEEN AT THE END OF THE MECHANICAL AGE by K. G. Pontus Hultén. 216 pages; 240 illustrations; bibliography; tin-can steel bound. $6.95. Distributed by New York Graphic Society Ltd.

and Picabia's mocking machine portraits. The influential model of 1920 for a Monument for the Third International by the Russian Constructivist Tatlin has been reconstructed in the Museum Garden. The Dadaists' ironic and frequently poetic use of machine forms, Klee's early foreshadowing of the Surrealist fear of machines in the Twittering Machine, Giacometti's The Captured Hand, and Moholy-Nagy's Light-Space Modulator for the Bauhaus are among the works gathered for the exhibition as well as examples of Léger's romantic attitude to the machine and the Purists' interest in the superficial beauty of machine form.

Nine recent works, produced by the collaboration of artists and engineers for a competition sponsored by E.A.T. for the Museum, include the three prizewinners: a construction of red dust activated by the sound of heart beats; a mechanical fountain; and a cybernatic sculpture.

Two kinds of machines - the automobile and the camera - are represented by actual examples: a Bugatti Royale (1931), one of only seven ever manufactured; the Boot Hill Express created by fitting a Chrysler engine into the glass body of an antique horse-drawn hearse; a racing car hung on the wall; Buckminster Fuller's revolutionary Dymaxion Car No. 2 (1933-34), recently re-discovered; and the Lumière Brothers' Cinématographe (1895) which will be shown with some of the earliest Lumière films. Stills from Chaplin's "Modern Times" and films by Léger and Moholy-Nagy are shown continuously.

"The car and the camera are machines with which many people feel a strong emotional tie, as intimate extensions of their bodies. The car not only fulfills a practical purpose but has become a symbol, a focus for our fantasies, our hopes and our fears. The camera, together with some photographs and films, was chosen because it is a picture-making, mechano-chemical device, which has provided the basis for much of our way of seeing and is therefore particularly appropriate in an art exhibition," Mr. Hultén points out.

The title of the show relates to the fact that technology today is undergoing a critical transition. "We are surrounded by the outward manifestations of the culmination of the mechanical age. Yet, at the same time, the mechanical machine - which can most

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easily be defined as an imitation of our muscles - is losing its dominating position among the tools of mankind; while electronic and chemical devices - which imitate the processes of the brain and the nervous system - are becoming increasingly important....

"By the year 2,000, technology will undoubtedly have made such advances that our environment will be as different from that of today as our present world differs from ancient Egypt. What role will art play in this change? Human life shares with art the qualities of being a unique, continuous and unrepeatable experience. Clearly if we believe in either life or art, we must assume complete domination over machines, subject them to our will, and direct them so that they may serve life in the most efficient way - taking as our criterion the totality of human life on this planet. In planning for such a world, in helping to bring it into being, artists are more important than politicians, and even than technicians."

Simultaneously, Some More Beginnings, a show of 150 works submitted to the E.A.T. competition, will be shown at the Brooklyn Museum under the direction of Dr. W. Klüver, President of E.A.T.

Special evening events at The Museum of Modern Art presented in connection with the show include screenings of computer-produced films, a "Sound and Light" production, and a series of lectures. Every Wednesday at noon The Machine in Film, selected shorts, will be screened in the Museum Auditorium.

Some historical precedents illustrating earlier artists' attitudes toward the mechanical age are included in the exhibition: a woodcut of a cogwheel-operated cart by Dürer, 17th and 18th century Italian and French representations of machines as people; 19th century English caricatures; Winslow Homer's childhood drawing of a Rocket Ship (1849), and Daumier's lithograph of Nadar Elevating Photography to the Heights of Art (1852).

In the beginning of this century, the Italian Futurists hoped that through machines the whole world could be changed. Their view, however, remained rather superficial, Mr. Hultén notes; they enjoyed polished metals, bright colors, the noise of machines, and the heady sensations of speed and power, as seen in the speeding automobile series

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by Balla (1912-13). Boccioni's States of Mind series Mr. Hultén calls an exception to the general inability of the Futurists to reach a deeper understanding of what machines represented in people's emotional lives.

Key works by the late Marcel Duchamp in the exhibition include the Coffee Grinder, the beginning of his physical, poetic, aesthetic or ironic references to the machine, two versions of the famous Nude Descending the Stairs, The Bride, and a replica made under his direction of his great "love machine" - The Bride Stripped Bare by Her Bachelors, Even (the "Large Glass"). Another side of Duchamp's activity is represented by several of his optical devices which, like his "readymades," radically altered concepts of what constitutes a work of art.

Duchamp and Picabia were close friends and their encounter was one of the most fruitful in all of modern art. For both men, all existing modes of art seemed inadequate. Central to their thinking were ideas about the machine and its erotic significance. In an interview in Duchamp's studio in New York during his second visit to America in 1915, Picabia said: "Almost immediately upon coming to America it flashed on me that the genius of the modern world is in machinery and that through machinery art ought to find a most vivid expression." Among the group of works from his machinist period (1915-22) shown are his mocking machine portraits of Alfred Stieglitz and Marie Laurencin, his Girl Born Without a Mother, and Amorous Parade, as well as a 1924 stage model.

Picabia took his ideas to Zurich where the Dada movement was flourishing. The attitude of the Dadaists toward the machine varied widely: in Cologne Ernst and Baargeld used mechanical forms for poetic purposes; in Hanover Schwitters took a related position, but in Berlin Heartfield and Grosz abandoned their initial Dada skepticism for an almost unlimited admiration for constructivism and machine art.

The greatest work of the Russian Constructivist Tatlin, the model for a Monument for the Third International, a fusion into one structure of architecture and sculpture with motorized elements, has been reconstructed in the Museum Garden. Tatlin's theories, that the most aesthetic forms are the most economical and that the artist must respect the use

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of materials and the logical structure that arises out of them, influenced theater, film, architecture, furniture design, posters, and typography. Work by other Constructivists includes stage designs by El Lissitzky, Popova, and Vesnin.

Tatlin's "machine art" attracted a wide following in Germany among such artists as Grosz and Moholy-Nagy. The Bauhaus, which built its program on Tatlin's ideas, reflected a generally optimistic view toward machines, but the original ideas soon became diffused in a belief in the possibilities that technology offered for the artist's use and the desirability of applying principles of good design to manufactured articles.

The Purists, like the Russian Constructivists, wished to unify all the arts in the service of society and recognized that modern society must be increasingly dependent on technology. But they and Léger based their machine aesthetics on admiration for the clarity, precision, and elegance of machine forms. The Surrealists, such as Victor Brauner or Matta, on the other hand, feared and distrusted machines and either depicted them as enemies of nature or explored their erotic implications, as in Hans Bellmer's Machine-Gunneress in a State of Grace.

Mr. Hultén says that the rise of fascism, World War II, and the explosion of the atomic bomb further contributed to disillusionment with technology and man's rationality. When after the war a new Constructivism arose, most of what Tatlin and his followers had tried to achieve in relating technology to life was lost. Since the mid-fifties, artists like Munari and Tinguely have devoted themselves to an attempt to establish better relations with technology. "Standing astonished and enchanted amid a world of machines, these artists are determined not to allow themselves to be duped by them. Their art expresses an optimistic view toward man, the creator of machines, rather than toward technology as such. They lead us to believe that in the future we may be able to achieve other, more worthy relations with machines. Not technology, but our misuse of it, is to blame for our present predicament."

Jennifer Licht, Associate Curator of Painting and Sculpture at The Museum of Modern Art, assisted Mr. Hultén in organizing The Machine as Seen at the End of the Mechanical Age.

After the New York showing it will be exhibited at the University of St. Thomas, Houston, Texas, from March 25 through May 18, 1969, and at the San Francisco Museum of Art from June 23 through August 24, 1969.

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Photographs and additional information available from Elizabeth Shaw, Director, Department of Public Information, The Museum of Modern Art, 11 West 53 Street, New York, N. Y. 10019. 245-3200.

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THE MACHINE AS SEEN AT THE END OF THE MECHANICAL AGE
November 27, 1968 - February 9, 1969

Introductory Panel - Wall Label

Technology today is undergoing a critical transition. We are surrounded by outward manifestations of the culmination of the mechanical age. Nevertheless, the mechanical machine -- which can most easily be defined as an imitation of our muscles -- is losing its dominating position among the tools of mankind. Its reign is being threatened by the growing importance of electronic and chemical devices -- which imitate the processes of the brair and nervous system.

This exhibition is not intended to provide an illustrated history of the machine throughout the ages but to present a selection of works that represent artists' comments on aspects of the mechanical world. Such statements by artists have been particularly numerous in our own century, perhaps because we are now far enough removed in time from the early development of the mechanical age to be able to see some of the problems and realize some of the implications.

Although we tend to think of machines primarily in terms of their practical use, historically they have frequently been regarded as toys, marvels, or symbols. Since the beginning of the mechanical age and the time of the Industrial Revolution, some have looked to machines to bring about progress toward utopia, while others have feared them as the enemies and potential destroyers of humanistic values.

Leading artists of our time have held attitudes toward the machine ranging from idolatry to deep pessimism. They have used machines asmetaphors through which to comment upon society, or have welcomed them as providing new technical means of expression.

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Many artists today are working closely with engineers in collaborative efforts that may have significance far beyond that of merely producing new kinds of art for our delight. It is obvious that the decisions that will shape our society in the future will be arrived at and carried out through technology. Hopefully, these decisions will be based on the same criteria of respect for individual human capacities, freedom, and responsibility that prevail in art.

K. G. Pontus Hultén

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THE MACHINE AS SEEN AT THE END OF THE MECHANICAL AGE
November 27, 1968 - February 9, 1969

Exhibition Wall Labels

R. BUCKMINSTER FULLER, American, born 1895.

Dymaxion Car No. 2 (1933-1934)

A Modern Classic Rediscovered: Fuller's Dymaxion Car

Since the passenger car assumed its form about 1910, surprisingly little has been done to reconsider its design in terms of function rather than merely of styling. The most original reconsideration of automobile construction was that undertaken by R. Buckminster Fuller, who in 1933 demonstrated his first Dymaxion Car (the adjective is a fusion of syllables from "dynamism," "maximum," and "ions"). Many of its radical features were adapted from aircraft and boat design.

The prototype Dymaxion Car No. 1 was destroyed about ten years later in a garage fire. Only two others were ever built, though a fourth got as far as the drawing board. They differed somewhat in their details but not in their basic principles. After they passed out of Fuller's hands, Dymaxion Cars No. 2 and 3 disappeared from sight, but their revolutionary features had made them legendary.

Late last summer, a student at Arizona State University read an article on Fuller's cars and recalled a strange derelict automobile he had seen in a shed in Tempe, which seemed to correspond to the description and illustrations in the story. His identification was correct; he had rediscovered Dymaxion Car No. 2, here being exhibited to the public for the first time since the 1940s. Efforts are now underway to raise money for its restoration.

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The Dymaxion Car, which anticipated the first Chrysler Airflow, was not only streamlined but also constructed like aircraft. Most of its running gear was enclosed within two separate, independent frames, the outer one of aluminum over a chrome-

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molybdenum steel frame like that of a light airplane. It thus achieved maximum rigidity with minimum weight.

Using only a stock engine from a Ford V-8, Fuller's car attained with a 90-horsepower engine a speed of 120 miles per hour, which in an ordinary sedan of the time would have required an engine of over 300 h.p. The car had only three wheels -- two in front and one behind; the rear wheel controlled the steering, which as in a boat was counter-directional (that is, the driver, who sat ahead of the front wheels, moved the rear of the car to the left when he wanted to go to the right). Besides speed, the Dymaxion Car had exceptional maneuverability, being able to turn completely within its own length and park in a space only a foot more than its length.

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While serving in the Navy during World War I, Fuller first became aware of the possibilities that a rapidly developing technology was opening up. He believed, however, that traditional patterns of thought were preventing man from fully realizing the potentialities that these new advances in science and technology offered for controlling his environment.

Throughout his long career as philosopher, mathematician, and engineer, Fuller has devoted himself to what he calls comprehensive design -- that is, the exploration of the dynamic principles operative in nature, and their utilization to attain the utmost advantage for the largest number of people throughout the world. He has been especially concerned with problems of transport and mass shelter and is today probably most widely known for his geodesic domes. Created in many sizes, Fuller's domes have been used for such various purposes as to provide shelter in the Arctic for the Air Force's Distant Early Warning Line, and to house the United States Pavilion at Expo '67 in Montreal.

"In the last half century, man has graduated from a local twelve-mile radius daily domain into a world-around multi-thousand-miles radius daily domain.... I am convinced that humanity is characterized by extraordinary love for its new life and yet has been misinforming its new life to such an extent that the new life is continually at a greater disadvantage than it would be if abandoned in the wilderness by the parents.... I was born in 1895. The airplane was invented when I was 9 years old. Up to the time I was 9 years old, the idea that man could fly was held to be preposterous.... I have lived deeply into the period when flying is no longer impossible, but nonetheless a period in which the supremely ruling social conventions and economic dogma have continued to presuppose a nonflying man ecology."

Buckminster Fuller

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Four Automobiles in THE MACHINE AS SEEN AT THE END OF THE MECHANICAL AGE

November 27, 1968 - February 9, 1969

> The car was chosen both because it is probably the most typical machine of the twentieth century and because it is almost certainly the mechanical device that most effects our private, everyday lives. As such, it not only fulfills a practical purpose but has become a symbol, a focus for our fantasies, our hopes and our fears.
>
> - K. G. Pontus Hultén
> Guest Director

Ray Farhner's Boot Hill Express is a remodelled horse-drawn hearse, originally built over 100 years ago by the Cunningham Coach Works of New York, and purchased by Mr. Farhner from The Stagecoach Museum in Twin Cities, Minnesota in 1966. Reconstructed with a 500 h.p. Chrysler Street-Hemi engine (1966) and components from many other cars, the wooden body of the hearse remains essentially intact. Replacements include a fabricated tubular chassis; an early Model-T Ford steering wheel; the headlights and taillights are kerosene-burning lanterns from India. All metal parts are chrome plated, and the body is finished with over thirty coats of gold paint.

A leading feature car producer in the mid-west for more than six years, Farhner has won national awards for his custom cars. Mr. Hultén comments that Farhner, by equipping a formerly horse-drawn vehicle with a high-powered engine, has made a powerful statement on the car as producer of death and disaster.

The prototype Bugatti Royale -- "the culmination of the heroic period of the automobile, when optimism and confidence in this machine were still unclouded" -- was built in 1927 by Ettore Bugatti (formerly a painter) as a new kind of art work and his personal car. It was wrecked in an accident five years later. The Bugatti in the Museum's exhibition is among six more Bugattis designed between 1927-1932. Originally built in 1931 for Dr. Joseph Fuchs, it was acquired in 1940 and restored by Charles A. Chayne.

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An anachronism even before it was put on the market, the Bugatti Royale, designed to be the most perfect car ever built with an unlimited lifetime guarantee, was already too ostentatious in size (20' long, wheel base 14' 2") to be fashionable and too expensive ($40,000) on the brink of the Depression.

The most original reconsideration of automobile construction after the "classic" period of automobile designing in the twenties is attributed to Buckminster Fuller. His airflow, three-wheeled Dymaxion Car (1933) has the streamlining of a modern airplane fuselage and exceptional maneuverability. The Dymaxion (the word is a fusion of syllables from "dynamism," "maximum," and "ions") was part of Fuller's World-Town plan, which aimed to increase the world standard of living by getting maximum performance per pound from material resources.

In an accident that caused a lawsuit, the first Dymaxion was rammed on a demonstration run by an automobile owned by a prominent Chicago politician. Although the "freak car" was legally exonerated from being at fault in design or structure, unfavorable publicity caused cancellations of orders. Fuller repaired the first car, and built two more. Dymaxion Car No. 2 is in the Museum exhibition, and was found only late last summer in a shed in Tempe by a student from Arizona State University, who had read an article on Fuller's cars and recalled seeing the ancient derelict.

The modern racing car is the "apotheosis of the great dream of the 'twenties -- the beauty of the functional." Although the construction of a racing car is never modified for the sake of aesthetics, many of these cars must be regarded as extremely beautiful. As such, the modern racing car is an object "on the borderline between technology and art." The example on view is the McLaren B.R.M., driven in the Grand Prix of 1968 by Joakim Bonnier, the owner.

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Additional information available from Elizabeth Shaw, Director, and Joan Wiggins, Assistant, Department of Public Information, The Museum of Modern Art, 11 West 53 Street, New York, N.Y. 10019. 245-3200.

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MUSEUM OF MODERN EXHIBITS RECONSTRUCTION OF TATLIN TOWER IN

THE MACHINE AS SEEN AT THE END OF THE MECHANICAL AGE

November 27, 1968 - February 9, 1968

A reconstruction of Vladimir Tatlin's model for the Monument for the Third International, a fusion in one structure of architecture and sculpture with motorized elements, will be on view in the Museum's outdoor Sculpture Garden during the exhibition The Machine as Seen at the End of the Mechanical Age, from November 27, 1968, through February 9, 1969. The Monument and the revolutionary ideas about the unity of art and technology that the Soviet artist expressed had widespread influence on the arts of our time.

Background: The first model for the Monument, which was intended to be over 1,300 feet tall (taller than the Eiffel Tower), was commissioned by the People's Commissariat for Education and built by Tatlin and his assistants in 1920; a slightly different version was shown in Moscow in the same year. Another version was exhibited in Paris in 1925, but all the original models have been lost or destroyed.

The Monument was designed to contain four rotating glass chambers within a double spiral of steel to house the activities of the Third International, the world organization of the Communist party founded in 1919 to accelerate the world revolution. The lowest chamber, a cylinder, meant to rotate slowly once over the course of a year, was for the conferences of the International's legislative council; above that, a pyramid rotating once a month was for executive activities; that was surmounted by another cylinder, turning daily, to serve as an information center. The top structure was a hemisphere, rotating still more rapidly, for the canteen. The entire structure was to be joined together by diagonal steel beams.

Though the tower was conceived as a metal structure, Tatlin built his model of wood, because metal was not available. The wood was made to look like steel girders, and even the nails were hammered flat to resemble rivets. Moving parts were made of paper and net to simulate glass and steel.

The Monument was never built, in part because the technological potential and financial resources did not exist, and in part because all the Party leaders did not approve it. Trotsky, for example, thought the tower did not relate to the functions of the International and was overly elaborate. The model, however, aroused great interest and equally great controversy and comment among writers and artists, who generally championed it.

Significance: Tatlin's was the first truly integrated vision of the unity of art and technology, and he intended to put his art at the service of the Revolution. "The purpose of the Russian Revolution was not simply to change the form of society but also to give the new form a new content, a new meaning,"

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states Pontus Hultén, director of The Machine and of the recent Tatlin exhibition at Moderna Museet, Stockholm. Tatlin's machine art expressed this view, especially in his theory of the expressive value of the materials themselves--iron, wood, glass, and concrete--the materials of the modern world. For Tatlin, "the material is the message," and he erased the distinction between aesthetic and practical, between form and content. This total re-thinking of Western aesthetics was and remains of great influence.

The spiral form of the tower reflects Tatlin's view of art as dynamic and constructive: "Here is the resolution of the most difficult problem of culture, that of unifying the utilitarian and the purely creative form. Just as the triangle, with its balance of parts, is the best expression of the Renaissance, so the spiral is the expression of our spirit," he said.

Tatlin's ideas about the unity of art and technology were taken up by his pupils, the Constructivists and Productivists,and affected many forms of art including architecture, theatre, furniture design, typography and other arts. Following an exhibition of Russian art in Berlin in 1922, his influence was widely felt in the West. El Lissitzky and Lászlő Moholy-Nagy founded a Constructivist group in Berlin, and subsequently, through Moholy's teaching at the Bauhaus, Tatlin's ideas were still further disseminated. The Bauhaus program in fact was in large part based on Tatlin's ideas.

Reconstruction: Work was based on only four photographs (a crucial one was discovered during the process), a few drawings, some writtendescriptions and information from the sole living assistant of Tatlin. Troels Andersen, Ulf Linde, and Per Olof Ultvedt of the Stockholm Academy of Art prepared a small wooden working model. From this, carpenters Arne Holm and Eskil Nandorf built the reconstruction, which is 15 feet 5 inches high, about the same size as Tatlin's.

The research and reconstruction took about a year. The tower was first exhibited in the Tatlin show at Moderna Museet in Stockholm last summer. It was shipped to the United States in nine crates and reassembled by Mr. Nandorf in the Museum Garden.

Vladimir Tatlin: Born in 1885; studied art in Moscow; visited Picasso in 1913 and saw his metal cut-out collages. In addition to the tower, Tatlin worked on a flying machine powered by human muscles, did stage and costume designs and textiles, and even built an oven. Much of his work has been lost or remains in the Soviet Union, where it is little-known and rarely seen. Tatlin died in 1953.

Vladimir Tatlin, the illustrated catalogue of the 1968 exhibition at Moderna Museet, Stockholm, including English text, is on sale at the Museum bookstore for $4.00. Tatlin's work and influence are also extensively discussed and illustrated in the catalogue of the Museum's exhibition, The Machine as Seen at the End of the Mechanical Age, on sale for $6.95.

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Additional information and photographs available from Elizabeth Shaw, Director, Department of Public Information, and Patricia D. Bauman, Coordinator, Press Services, The Museum of Modern Art, 11 West 53 Street, New York, N. Y. 10019. 245-3200.

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The Museum of Modern Art

Monday, November 11, 1968

11 West 53 Street, New York, N.Y. 10019 Tel. 245-3200 Cable: Modernart

Two series of special evening programs, including computer-made films, electronic music, and illustrated lectures, will be presented at The Museum of Modern Art in December and January in connection with the exhibition, THE MACHINE -- as Seen at the End of the Mechanical Age, on view from November 27 through February 9.

Four programs dealing with man, the arts, and the technological age will be presented on Monday evenings at 8:30. This series begins on December 2 with "An Evening of Computer-Produced Film," arranged and discussed by scientist Kenneth Knowlton of Bell Laboratories. Billy Klüver, President of Experiments in Art and Technology, will lecture December 16 on "The Artist and Industry" in terms of materials, technical personnel, and financial support. "Sound and Light," a program of electronic music and light works, will be presented on December 30 by musicians La Monte Young and Marion Zezeela, who are represented in THE MACHINE exhibition by a sound-light sculpture. In the last program on January 27, John McHale, Director of the Center for Integrative Studies, School of Advanced Technology, State University of New York at Bighamton, will talk on man and technological extensions in a program entitled "Man ±."

Tickets for the Monday night series will be $9.00 to Museum members; $12.00 to non-members. Single admission will be $2.60 to members and $3.50 to non-members.

Young art historians will discuss artists and art movements represented in THE MACHINE exhibition in a series of Wednesday evening lectures at 8:30. Troels Anderson of the Slavonic Institute in Copenhagen will speak on Vladimir Tatlin on December 4. January 22, Ronald Hunt, Art Librarian at the University of Newcastle upon Tyne, England, will discuss "The Ghost in the Machine: Art and Politics." Both men, who participated in organizing the exhibition, are primarily concerned with the role of the machine in art in the early part of the century, particularly in Russia. Marianne Martin, on December 18, will lecture on "The Futurist 'Mecchanismo.'" Professor Martin is the author of the recently published Futurist Art and Theory, 1909-1915. Lawrence Steefel, Jr., of the

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University of Washington at St. Louis, who is currently writing a book on the late Marcel Duchamp, will lecture on January 8 on the machine in relation to Duchamp's work.

Series tickets for the Wednesday evening programs will be $6.75 to Museum members and $9.00 to non-members. Single admission will be $2.00 and $2.50 respectively. They can be purchased by mail by sending a self-addressed, stamped envelope, or at the Membership and Information Desk in the entrance lobby of the Museum.

The special lectures and discussions have been arranged by Anne Hanson, Director of The Lillie P. Bliss International Study Center at the Museum. The exhibition, THE MACHINE -- as Seen at the End of the Mechanical Age, includes about 200 works of painting and sculpture, cars, cameras, and technological and electronic works, selected by K. G. Pontus Hultén, Director of Moderna Museet in Stockholm.

EXPERIMENTS IN ART AND TECHNOLOGY, INC.
9 East 16 Street, New York, N. Y.

THE MUSEUM OF MODERN ART
11 West 53 Street, New York, N. Y.

The names of the American engineers who were awarded prizes in the international competition arranged by Experiments in Art and Technology in connection with The Museum of Modern Art exhibition, The Machine as Seen at the End of the Mechanical Age, were announced November 11 at a press conference-demonstration at the Museum. Purpose of the competition, launched a year ago, was to find the most inventive contribution by an engineer to a work of art produced in collaboration with an artist.

Winners of the $3,000 first prize were Harris Hyman and Ralph Martel, who collaborated with artist Jean Dupuy to construct a sculpture of dust. Frank Turner was awarded a $1,000 second prize for his contribution to Wen-Ying Tsai's cybernetic sculpture of stainless steel rods and strobe lights; Niels O. Young also won a second prize of $1,000 for his role in making Fakir in 3/4 Time, mechanical fountain, with his artist wife Lucy Jackson Young.

The first prize was awarded by P. L. Siemiller, Co-chairman of the American Foundation on Automation and Employment, which donated the prize money. Mr. Siemiller is also President of the International Association of Machinists and Aerospace Workers (AFL-CIO). The two second prizes were donated by the McCrory Corporation and Richard Brandt, President, on behalf of the Trans-Lux Corporation.

The prizewinning works are included in The Museum of Modern Art exhibition on view from November 27 through February 9. At the same time, all the entries in the E.A.T. competition are being shown in an exhibition at the Brooklyn Museum, Some More Beginnings, opening November 26.

In Heart Beats Dust, first prizewinner, the essential material is red dust lying on a stretched rubber membrane enclosed in a glass-faced cube. The dust is activated by acoustic vibrations produced by the rhythm of heart beats and made visible by a light beam of high intensity. "Like many works of recent years, Heart Beats Dust manifests a new form of cooperation with nature," according to Pontus Hultén, Guest Director of The Museum of Modern Art exhibition. "A sensitive collaboration between natural forces within and outside the

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human body has here been achieved." Hyman and Martel received special technical advice from Charles Coster and Robert Maziarz of North American Phillips, Incorporated, and Rodney F. Kaiser of Kliegl Brothers.

Fakir in 3/4 Time is a mechanical fountain. Its creators, Lucy Jackson Young and her husband, Niels O. Young, engineer, point out that it is the first machine to do the Indian rope trick. Based on the same principle as that of the lariat, in which the motion of a loop of cord along its own length causes it to become rigid, the cord in Fakir in 3/4 Time, instead of being swung at the end of a tether, is gobbled in and spewed out again by means of an electric motor and sheave, at the rate of 100 miles an hour.

The Cybernetic Sculpture, created by artist and engineer Wen-Ying Tsai, is based on the principle of the harmonic motion in a "standing wave" produced by a vibrating rod. Multiple stainless steel units, each more than nine feet high, with a 20 inch diameter at the base, are grouped together. The visual effect when in motion is continually modulated by high frequency stroboscopic lights. The lights react to sound, such as that of a voice or the clapping of hands. The sense of contact with the sculpture that the viewer obtains is due to the subtlety of the work's reaction; the response of the trembling rods seems a direct translation of his voice. "The technical solution that produces this illusionistic feat is at once so discreet and so efficient that it strikes us as perfect," Mr. Hultén says.

The winning works were selected from more than 150 submissions from artists in nine countries. The jury consisted of five scientists and engineers who were not necessarily knowledgeable about contemporary art. The jurors were unfamiliar with the participating engineers. They were: James M. Brownlow, International Business Machines Research Laboratories; Michael D. Golder, Plastic Research and Development Center, Celanese Plastics Company; Cyril M. Harris, Professor of Electrical Engineering and Architecture, Columbia University; John W. Pan, Bell Telephone Laboratories; and William G. Rosen, Special Assistant to the Director, National Science Foundation, and Executive Secretary of the Committee on Academic Sciences and Engineering of the Federal Council for Science and Technology.

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In makingthe awards for the most inventive use of new technology as it evolves through the collaboration of artist and engineer, the jurors were asked to base their judgements on these criteria: First, how inventive and imaginative is the use of technology? Second, to what extent have the engineer and artist collaborated successfully?

In making their decision, the jurors issued the following statement:

> In each of the winning entries a spectrum of technology was used with great impact on the art forms. Evident is the realization that neither the artist nor the engineer alone could have achieved the results. Interaction must have preceded innovation. Going beyond a demonstration of technical prowess or an intricate orchestration of art and technology, the engineer and artist together have created more than a well-executed realization of fantasy. The unexpected and extraordinary, which one experiences on viewing these pieces, result from inventiveness and imagination, stimulated not by the brute force of technical complexity but by probing into the workings of natural laws.

In addition to the prizewinning engineers and the artists, others present at the conference were: Theodore W. Kheel, President of the American Foundation on Automation and Employment; Richard Brandt, President of Trans-Lux Corporation; Meshulam Ricklis, President of the McCrory Corporation; Bates Lowry, Director of The Museum of Modern Art; K. G. Pontus Hultén, Director of Moderna Museet in Stockholm and Guest Director of The Museum of Modern Art's exhibition; Dr. Billy Klüver, President of E.A.T.; and Robert Rauschenberg, Chairman of the Board, E.A.T.

Representatives of labor and industry, who were invited, included Lane Kirkland, Assistant to George Meany, President of the Central Labor Council (AFL-CIO); Ralph Gross, President of the Commerce and Industry Association; Edward Swayduck, President of Local One Amalgamated Lithographers of America; Seymour Schweber of Schweber Electronics; and Dr. Atelstan Spillhaus, The Franklin Institute, Philadelphia.

Experiments in Art and Technology (E.A.T.), an international organization, was established in 1967 to develop an effective collaboration between engineers and artists. The aim of the non-profit organization is to encourage new work which is not the preconception of either the engineer or the artist but which is the result of their joint explorations.

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Additional information available fromElizabeth Shaw, Director, Department of Public Information, The Museum of Modern Art, 11 West 53 Street, New York, N.Y. 10019. 245-3200.

FIRST PRIZEWINNER - E.A.T. COMPETITION FOR THE MUSEUM OF MODERN ART EXHIBITION, THE MACHINE AS SEEN AT THE END OF THE MECHANICAL AGE - Nov. 27, 1968 - Feb. 9, 1969. DIRECTED BY K. G. PONTUS HULTEN.

Jean Dupuy. French, born 1925. (artist)

Ralph Martel. American, born 1935. (engineer)
E.H.N. Graphics, Incorporated.

Harris Hyman. American, born 1936. (engineer)

Heart Beats Dust. 1968
Wood, glass, Lithol Rubine, tape recorder, co-axial speaker, tungsten-halogen lamp, rubber; 72" x 22" x 22"

Special technical assistance: Charles Coster and Robert Maziarz of North American Phillips, Incorporated, and Rodney F. Kaiser of Kliegl Brothers.

Heart Beats Dust is a sculpture of dust. The propulsion system works by sound. The structure is a black rectangular box with a window at eye level opening on a 24" cube which houses the sculpture. The form is made by thrusting dust up into a cone of light supplied by a stage light from overhead. The dust is Lithol Rubine, a brilliant red pigment of low specific gravity, chosen for its ability to remain suspended in air for long periods. The thrust is achieved by a half-minute continuous loop tape recording of heartbeats played through a 15" co-axial speaker mounted directly under a tightly stretched rubber membrane on which the dust lies. The lighting source is a 250-watt quartz element with shutters and a lens to give intense light with sharp edges.

"The essential material of this sculpture is dust, enclosed in a glass-faced cube and made visible by a light beam of high intensity. The dust is activated by acoustic vibrations produced by the rhythm of heart beats. As an artist, Dupuy worked with polyethylene plastic, which by generating static electricity attracts and retains dust. While seeking a means to avoid this, he had the idea of utilizing the dust itself as a medium. Like many works of recent years, Heart Beats Dust manifests a new form of cooperation with nature. A sensitive collaboration between natural forces within and outside the human body has here been achieved. An earlier use of dust as an artistic medium was by Marcel Duchamp. While he was working on the Large Glass, after having left it untouched for a long time he found it covered with

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dust and decided to let some of it be the material for the sieves above the chocolate grinder. He fixed the dust in that area with varnish. In 1920, Man Ray took a famous photograph of this Breeding of Dust (Elevage de Poussiere)."

K. G. Pontus Hultén in
The Machine - As Seen at the End of the Mechanical Age. Published by The Museum of Modern Art, New York, 1968.

SECOND PRIZEWINNER - E. A. T. COMPETITION FOR THE MUSEUM OF MODERN ART EXHIBITION, THE MACHINE AS SEEN AT THE END OF THE MECHANICAL AGE - Nov. 27, 1968 - Feb. 9, 1969. DIRECTED BY K. G. PONTUS HULTEN.

Wen-Ying Tsai. American, born China, 1928 (artist and engineer)

Frank T. Turner. American, born 1911 (engineer)

Cybernetic Sculpture. 1968
Multiple stainless steel units, each 9'4" high x 20" diameter at base; oscillator, stroboscopic lights, electronic equipment
Howard Wise Gallery, New York City

In this sculpture, stainless steel rods are vibrating at 30 cycles per second and are illuminated by strobe lights whose rate of flashing is controlled by sounds in the environment. In a state of synchronization with the lights and the rods at 30 cps, the rods appear to be still, in the shape of a harmonic curve. Any sound varies the strobe lights' voltage-controlled trigger oscillator which changes the rate of flashing. The difference between the rate of vibrating and the flash rate produces the illusion of motion in the rods. The greater the deviation between the two frequencies, the more undulatory motion seems to develop in the rods.

"This sculpture is based on the principle of the harmonic motion in a 'standing wave' produced by a vibrating rod....Here, several units are grouped together. Their visual effect when in motion is continually modulated by high-frequency stroboscopic lights. The lights react to sound, such as that of a voice or the clapping of hands. The sense of contact with the sculpture that the viewer obtains is due to the subtlety of the work's reaction; the response of the trembling rods seems a direct translation of his voice.

The technical solution that produces this illusionistic feat is at once so discreet and so efficient that it strikes us as perfect."

K. G. Pontus Hultén in
The Machine - As Seen at the End of the Mechanical Age. Published by The Museum of Modern Art, New York, 1968.

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November 22, 1968

EXPERIMENTS IN ART AND TECHNOLOGY, INC.
9 East 16 Street, New York, N. Y.

THE MUSEUM OF MODERN ART
11 West 53 Street, New York, N. Y.

To: City Desks

From: Elizabeth Shaw, Director, Department of Public Information, The Museum of Modern Art,
Phone: 245-3200

The original press release of November 11, 1968, announcing the winners in the competition sponsored by E.A.T. for The Museum of Modern Art's exhibition <u>The Machine as Seen at the End of the Mechanical Age</u>, did not make clear the role of artist-engineer Wen-Ying Tsai in creating <u>Cybernetic Sculpture</u>. Over the past several years, Mr. Tsai, who received his engineering degree from the University of Michigan, has developed a series of sculptures based on harmonic motion and stroboscopic effects. <u>Cybernetic Sculpture</u> is based on the principle of the harmonic motion in a "standing wave" produced by a vibrating rod. Multiple stainless steel units, each more than nine feet high, with a 20 inch diameter at the base, are grouped together.

Mr. Tsai enlisted the aid of engineer Frank Turner to help him perfect a device sensitive and responsive to sound for one these sculptures. It was on the basis of this technical contribution of the work that Mr. Turner received a second prize in the E.A.T. competition. Mr. Turner has since shared the award with Mr. Tsai for his part of the work.

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SECOND PRIZEWINNER - E.A.T. COMPETITION FOR THE MUSEUM OF MODERN ART EXHIBITION, THE MACHINE AS SEEN AT THE END OF THE MECHANICAL AGE - Nov. 27, 1968 - Feb. 9, 1969. DIRECTED BY K. G. PONTUS HULTEN.

Lucy J. Young. American, born 1930 (artist)

Niels O. Young. American, born 1929 (engineer)
Physicist specializing in instrument development; Vice President, Block Engineering, Incorporated

Fakir in 3/4 Time. 1968

Textile tape, aluminum, plastic, variable speed motor;
base 25" x 16" x 30", height 4' to 40', adjustable from base

The principle is the same as that of the lariat. In the lariat a loop of cord remains rigid, and can even bounce off obstructions, because of the motion of the cord along itself. Here, instead of the loop being swung at the end of a tether, it is propelled along itself at 100 miles per hour by means of an electric motor and sheave.

The head contains a 1/2 horsepower at 10,000 r.p.m. universal motor for driving the loop by means of a vacuum capstan similar to those used on computer tape decks. The head also contains an altitude and azimuth gear motor for pointing the cord stream. A number of slip rings preserve necessary electrical connections and the head itself acts as a sealed plenum kept at a pressure below atmospheric pressure. Outside air thus presses against the cord material on the sheave, travels through the perforated sheave, through the head, and is pumped out through the neck of the head.

The control unit pumps air from the head by means of a spiral blower and supplies power to the drive motor through a variable transformer. The altitude and azimuth motors are also supplied power so that they can assume any speed, from full forward to full reverse.

"The creators of this mechanical fountain point out that it is the first machine to do the Indian rope trick. The basic principle by which a loop of otherwise limp cord could be coaxed into apparent rigidity and made to stand up was discovered only a couple of years ago. It is the same principle as that of the lariat, in which

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the motion of a loop of cord along its own length causes it to become rigid. In Fakir in 3/4 Time, the cord, instead of being swung at the end of a tether, is gobbled in and spewed out again by means of an electric motor and sheave, at the rate of 100 miles per hour. Because of its speed, the stream of cord resists deflection until it reaches the end of its loop, when it has to turn about and return to the machine. The head operates by means of a vacuum capstan.

"Fakir in 3/4 Time has the elegance of a very simple solution. The choreography of this mechanical fountain is manually adjustable, but theoretically it could be programmed...."

K. G. Pontus Hultén in
The Machine - As Seen at the End of the Mechanical Age. Published by The Museum of Modern Art, New York, 1968.

Hilary Harris American, born 1929.

James Macaulay Scottish, born 1923.
Free lance Design Engineer.

<u>Arm</u> 1968

Aluminum alloy, servo motors, servo control device; 55" x 21" x 16", with maximum radius of 55"

Arm is composed of 5 elements, each capable of independent movement. Each element is a rectilinear box containing an electric motor for rotating the element immediately above it, controlled in speed and position by a master motor in the base. The movement of <u>Arm</u> is choreographed by a control track which commands the master motor in speed and position and the amplifying "slave" motors in the links of the arm respond in speed and position to the master. Choreographic instructions are conveyed by synchro transmitting motors, which"read" the control chart and are linked by wires to a servo motor within each arm element. The control chart is a rolling ribbon of 12" inch wide plastic into which grooves are engraved by the choreographer. A light stylus rides in the groove, translating its wave motion into linear motion and then into rotation by means of a rack and pinion mechanism.

Lillian Schwartz American, born 1927.

Per Biorn Danish, born 1937.
Electrical Engineer, Bell Telephone Laboratories.

The Proxima Centauri 1968

Plastic, slide projector, ripple tank, electronics; 2½' diameter globe, 30" x 30" x 54" plastic base

An automatically changing projector displays 81 abstract slides on a frosted globe through a ripple tank. The ripple tank is agitated 5 seconds every minute, allowing the image to settle before reagitation. When the sculpture is approached, 4 switches (mats) turn on a motor that lowers the globe. Light switches turn on a red glow on the globe during movement. When the globe reaches its hidden position, the red glow disappears and the projector now displays the slides in focus. The globe returns to its normal position when the viewer leaves.

Richard Fraenkel American, born 1943.

Jeffrey Raskin American, born 1943.
Instructor, University of California

<u>Picture Frame</u> 1968

Computer-generated ink drawing on paper, embossed wooden frame; 12½" x 14½"

In the drawing, the three-dimensional design embossed on the picture frame was reproduced two-dimensionally on a CalComp Digital Incremental Plotter driven by an IBM 1401. The calculations were performed on an IBM 360/67. The program that produced the picture was written in Fortran IV and uses the Quick-Draw Graphics System. This graphics system allowed a small unit of the picture to be defined in terms of short line segments. This small portion was then rotated, reflected, and translated to make up a basic diamond-shaped unit. A number of these units formed a row, and then a double row was defined. This double row was stepped across repeatedly to make the final picture.

Leon D. Harmon American, born 1922.

Kenneth C. Knowlton American, born 1930.
Computer Program Research, Bell Telephone Laboratories.

<u>Studies in Perception I, II, and III</u> 1967

Computer-processed photographic prints; 2½' x 5', 2' x 3', 2' x 3'

A 35mm transparency of a photo is scanned by a flying-spot scanner, and the resultant electrical signals are converted into numerical representations on magnetic tape.

The first step taken by the computer is to fragment the picture into rows and fragments per row, and the average brightness level of each fragment is computed. The brightness levels are encoded, and the picture is now represented by numbers, each of which represents a small area having one possible brightness value.

In the processed picture, agiven brightness (density) is reproduced by the number of black dots occupying a given square. Instead of randomly sprinkling black dots over the 11 x 11 square in the proportion called for by any given brightness level, the dots are organized into micropatterns (e.g., a cat, an umbrella) which can be seen at close range. When a particular brightness level is called for, the computer makes a random choice among the set which fits that level. The picture is produced on frames of microfilm by a microfilm printer and then photographed.

Robin Parkinson American, born 1945.

Eric Martin American, born 1944.
Student of Architecture, Columbia University.

Untitled 1968

Plexiglass, motor, fur bag, microphone, electronic equipment, photo-electric control; 11" diameter

The sphere has three photo sensors and one microphone, causing the sphere to roll when activated. The microphone is connected to an amplifier. The light-sensing circuits are photo-resistance comparison circuits coupled to a pulse amplifier. The sphere sends out a pulsing light; when the light is reflected back to the sphere, the resistances change, activating the motor and making the sphere roll.

Both systems are fed into a Schmitt trigger, which activates a three-phase ring counter and a delayed drop-out relay timer. The latter times the duration of each movement. The ring counter is coupled to three relays which activate the motors and change their polarity.

The internal mechanism of the sphere has a low center of gravity, The wheels pull this internal mechanism up the side of the sphere, causing the center of gravity to shift and the sphere to roll. Once the sphere has begun to roll, the center of gravity and the motion of the internal structure reach equilibrium, making the sphere roll at a constant rate.

When activated, the sphere moves in any one of three directions, never setting off in the same direction twice in a row.

John Anthes American, born 1944.

Tracy S. Kinsel American, born 1930.
Laser communications, Bell Telephone Laboratories.

E.L.L.I. (Electronic Laser Light Image) 1968

Laser, electric organ, mirrors, electronics; 51" x 26" x 26"

The light source is a small, low-power helium-neon laser (whose high-power density provides a brighter image than could be achieved with a non-coherent source). The laser beam passes through an X-Y deflector, under the control of two electrical signals, which produces movement in two orthogonal directions independently. The deflected beam is projected onto a rotating screen. The time that the beam is swept into a region of the screen determines the spatial location of the image in the direction along the light beam. Thus a three-dimensional, controlled optical image is constructed. Audio signals (an FM receiver or a Hammond organ) are used to construct the image.

November, 1968

The Museum of Modern Art
11 West 53 Street, New York, N.Y. 10019 Tel. 245-3200 Cable: Modernart

THE MUSEUM OF MODERN ART PUBLISHES

The Machine - As Seen at the End of the Mechanical Age

Author: K. G. Pontus Hultén, Director of Moderna Museet, Stockholm

Designers: K. G. Pontus Hultén, John Melin, Gösta Svensson

Cover design: Anders Österlin, after a photograph by Alicia Legg

Details: 216 pages; 240 illustrations ; bibliography

Price: $6.95

Distribution: New York Graphic Society Ltd.

In a new departure in book production techniques, The Machine - As Seen at the End of the Mechanical Age has a tinned sheet-steel cover, hinged front and back, with an adaptation of the Museum's facade printed in full color and embossed on the tin. Specially produced in Sweden, the book and its design were conceived and supervised by Mr. Hultén. The tin-can steel cover was made by PLM AB Platmanufaktur, a beer can manufacturer.

Mr. Hultén comments in detail on over 200 examples in which artists have either embraced the machine as a means of attaining a utopian society, or rejected it as the potential enslaver of mankind, or have reacted to it ambiguously. The book covers works from the Renaissance to the present day, and includes a special section devoted to nine works (including the three prizewinners) selected from a world-wide competition this year co-sponsored by Experiments in Art and Technology (E.A.T.).

K. G. Pontus Hultén, Guest Director of the Museum's exhibition, is Director of Moderna Museet in Stockholm. Born in 1924, Mr. Hultén received the B.A. degree and PhD in Art History from the University of Stockholm. He became Curator of Moderna Museet in 1957 and Director in 1962. The exhibitionshe has directed there include Art in Motion, a kinetic art show (1961), and She, a monumental cathedral built by Niki de Saint Phalle and Jean Tinguely (1966).

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Review copies and additional information available from Elizabeth Shaw, Director, Department of Public Information, and Patricia Bauman, Press Coordinator, The Museum of Modern Art, 11 West 53 Street, New York, N.Y. 10019. 245-3200.

The Museum of Modern Art

11 West 53 Street, New York, N.Y. 10019 Tel. 245-3200 Cable: Modernart

K. G. PONTUS HULTEN

Guest Director of THE MACHINE AS SEEN AT THE END OF THE MECHANICAL AGE

K. G. Pontus Hultén, Director of Moderna Museet in Stockholm, has selected and installed the more than 220 works in The Museum of Modern Art's exhibition. He is author of the catalogue accompanying the exhibition, and participated in its design.

Born in Stockholm in 1924, Mr. Hultén received a B.A. degree (1948) and a PhD (1951) from the University of Stockholm. Mr. Hultén has studied and travelled extensively throughout Europe, including France (at the Sorbonne), England, Italy, and Greece.

Mr. Hultén became Curator of Moderna Museet in 1957 and its first Director in 1962. Moderna Museet, inaugurated in 1958, is a vital center of intellectual activities, which have often aroused violent debates in the Swedish and foreign press. Moderna Museet's state-owned collection of about 2,500 paintings and sculptures includes the most important collection of 20th century Swedish art along with a representation of such international artists as Fernand Léger, the Surrealists, Alexander Calder, Jean Tinguely, and American Pop Art. Frequently programs and special exhibitions are arranged in collaboration with other institutions such as the Museum of Architecture, Friends of the Photographic Museum, societies of avant-garde music and jazz, and with Swedish Radio and Television.

As Director, Mr. Hultén has been responsible for such exhibitions as Art in Motion, a kinetic art show (1961), She, a monumental cathedral built by Niki de Saint Phalle, Jean Tinguely, and P. O. Ultvedt (1966), Vladimir Tatlin (1968), and has organized a series of exhibitions of modern Swedish art abroad.

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Additional information available from Elizabeth Shaw, Director, Department of Public Information, and Joan Wiggins, Assistant, The Museum of Modern Art, 11 West 53 Street, New York, N.Y. 10019. 245-3200

The Museum of Modern Art

To CITY EDITORS, ASSIGNMENT EDITORS

From Elizabeth Shaw, Director, Department of Public Information, Phone: 245-3200.

Date November 22, 1968

Re THE MACHINE AS SEEN AT THE END OF THE MECHANICAL AGE Exhibition and Preview

More than 3,200 people have accepted invitations to attend the black tie Contributing Members preview of The Machine As Seen at the End of the Mechanical Age at The Museum of Modern Art, Monday evening, November 25 from 8:30 to 11:30 p.m.

Members of the Museum's International Council, art patrons from all over the country who are holding their Annual Meeting in New York, will also attend the preview, as well as the dinner in the Museum Penthouse for 300 guests.

Trustees, artists, lenders and other dinner guests will have an opportunity to see the exhibition between 6:30 and 7:30 p.m. before dinner and can be easily photographed at that time when the galleries are not crowded.

If you plan to assign a reporter or photographer, please ask him to stop by the Information Desk in the Main Lobby for a pass, guest list and any other assistance he needs.

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The Museum of Modern Art

To MACHINE PRESS KIT

From

Date

Re

general Machine press release-to be offset
Three releases on EAT prizewinners (Tsai correction) - xerox to make 50 each
Special programs with red schedule -- xeroxed to make 50 with corrected red schedule
Bio on Hulten -- xerox 50
3 Cars -- xerox 50
Fuller Dymaxion -- xerox 50
Tatlin fact sheet
catalog release -- xerox to make 50
introductory panel wall label -- xerox xexm 50
EAT press release -- corrected and xerox 50

Garry to get 50 folders