2 Toward the Art and Aesthetics of the Machine

The Machine as Seen at the End of the Mechanical Age

The transformation of conceptions of technology from the mechanical paradigm to that of cybernetics, and the accession of what Gotthard Günther has called "transclassical machines," became increasingly palpable during the 1960s. This trend was pinpointed by an exhibition that K. G. Pontus Hultén, the Swedish curator and director of the Moderna Museet in Stockholm, was invited to organize at the Museum of Modern Art in New York City, where it opened in November 1968.[1] The exhibition title, "The Machine as Seen at the End of the Mechanical Age," indicated the self-conscious and conceptual approach Hultén took toward the representation of machines from the perspective of a time characterized by fundamental technological change (figure 2.1). In its main part, the exhibition presented works by over one hundred artists from the early twentieth century through the 1960s. There were also some items by artists and inventors from the period since the Renaissance, including drawings by Leonardo da Vinci, a photograph of the defunct *Duck* (1733) automaton by Jacques Vaucanson, and an eighteenth-century automaton by Pierre Jaquet-Droz, as well as caricatures and objects from the nineteenth century that documented the early development of automobiles and cinematographic cameras. Hultén summarized the cultural history of machines in his introduction to the catalog and emphasized that while machines featured prominently in nineteenth-century literature, they were all but ignored by the visual arts. Consequentially, the exhibition proper starts with the celebration of the machine by the futurists at the beginning of the twentieth century.

In Hultén's career, "The Machine as Seen at the End of the Mechanical Age" of 1968 was an important moment which tied together several of his previous interests and pointed toward the work he would later do as the director of the Musée National d'Art Moderne at the newly founded Centre Pompidou in Paris. But it was also just another show of this ambitious curator, in a year in which Hultén also organized an exhibition with work by Andy Warhol in Stockholm, and presented works of several Swedish artists at the Musée des Arts Décoratifs in Paris. Since the 1950s, Pontus Hultén had been one of the most influential international curators to feature what would become known as kinetic art in exhibitions such

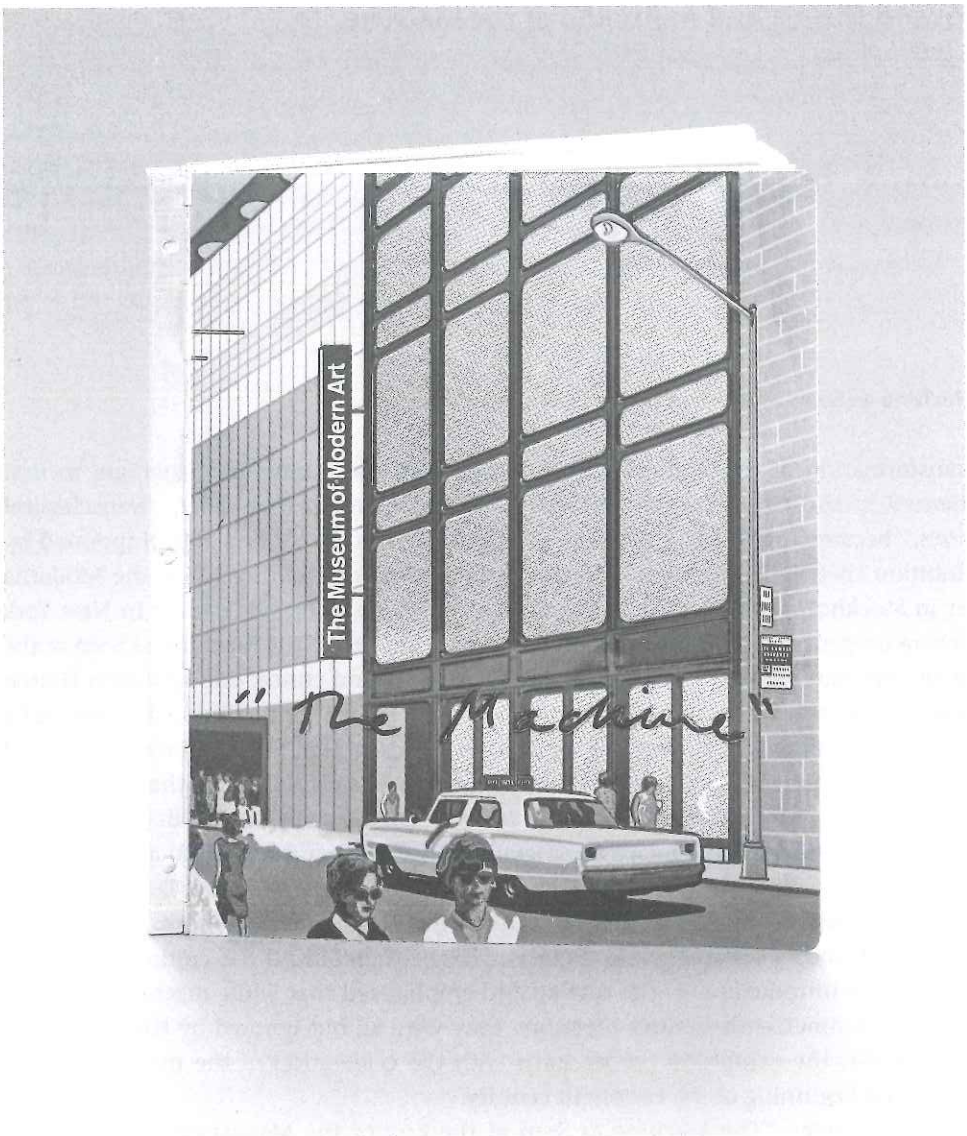

Figure 2.1
Cover of the exhibition catalog *The Machine as Seen at the End of the Mechanical Age*, curated by K. G. Pontus Hultén, Museum of Modern Art (MoMA), New York (1968). Stamped on aluminum, printed in color, 24.8 × 21.6 cm. Courtesy of The Museum of Modern Art, NY, Publications Department. Digital image © The Museum of Modern Art, New York/Scala, Florence 2015.

as "Le Mouvement" (Galerie Denise Renée, Paris, 1955) and the groundbreaking "Bewogen Beweging" (Dutch for "moved movement") presented in 1961, first at Amsterdam's Stedelijk Museum and then at Stockholm's Moderna Museet and Copenhagen's Louisiana Museum. This latter exhibition was built around a large number of works by Jean Tinguely, but it also included earlier works by Alexander Calder, and a 1960 replica of Marcel Duchamp's *Bicycle Wheel* (1913), as well as more recent conceptual works by Robert Rauschenberg and cybernetics-inspired work by British artists like Richard Hamilton, Victor Pasmore, and Roy Ascott.

In turn, "The Machine as Seen at the End of the Mechanical Age" can be taken as a fitting continuation of the mission of the New York MoMA to construct an art historical narrative affirming the position of a particular US modernism. The exhibition took its departure from the founding moments of the European twentieth-century avant-garde and combined the works of European and American artists, yet it placed an obvious focus on works made in the United States. Consequentially, the exhibition concluded with a section organized by the New York-based initiative Experiments in Art and Technology (E.A.T.), which sought to foster a particularly "American" style of cooperation between artists and engineers.

Moreover, the demonstration that Pontus Hultén gave of "the machine as seen at the end of the mechanical age" and the late-avant-gardist expansion of the field of art by kineticism rested strongly on the experience of New York City as a site of technology. The three main anchor artists of the show—Francis Picabia, Marcel Duchamp, and Jean Tinguely—all had strong connections with the city. Here, Picabia had been converted to his mechanomorphic style in 1915 under the impression of a particularly dynamic urban technological environment; Duchamp had made the first public presentation of a readymade, *Fountain* (1917), here and had lived in New York throughout the period when he was working on the *Large Glass*; and Tinguely had staged a signature piece for the withering of the mechanical age in the sculpture garden of MoMA in 1960 under the title *Homage to New York*. Tinguely was assisted in preparing the *Homage* machine performance by Billy Klüver, a Swedish Bell Labs engineer who a few years later went on to found E.A.T. Klüver interpreted Tinguely's appraisal of the city and his import of an aesthetics of dysfunctionality by pointing to the ambivalence of function and failure inherent to technics: "New York has humor and poetry, in spite of the presence of the machine, whereas in a purely technocratic society the machine must always be a functional object. Failures of the machine can therefore never be allowed, because control is the necessary element of that society. It is when the machine must function at any cost that there can be no *Homage to New York*."[2]

The interest that Hultén brought to the notion of the machine was topical rather than technological. "The Machine as Seen at the End of the Mechanical Age" was a distinctly art historical exhibition in that it presented works by futurist, constructivist, and surrealist artists from the modernist avant-garde, European as well as American, placing a focus on Duchamp and Picabia for the earlier decades, and concluding with a strong presence of works by Tinguely and other *nouveaux réalistes* and American neo-Dadaists, including Edward Kienholz, Claes Oldenburg, and Robert Rauschenberg.

With its curatorial focus on artworks, Hultén's exhibition differed significantly from other exhibitions that had dealt with the relation of art and technology in the twentieth century and that were still more or less well remembered in the 1960s. Before the Second World War, two New York exhibitions—"Machine Age" (1927), curated by Jane Heap, and "Machine Art" (1934), curated by Philip Johnson and Alfred Barr at MoMA—had both championed a functionalist conception of the "aesthetics of the machine," the former relating works of the 1920s avant-garde artists to modernist architecture, and the latter exclusively showing works of engineering and design, as works of "machine art." Hultén gestured toward this type of formalism, rooted in the appraisal of the applied arts since the late nineteenth century, by featuring automobiles in his exhibition. Besides the nineteenth-century cinematographic apparatuses, the inclusion of selected designer and racing cars forms the most significant exception to the artistic program of the show. Hultén viewed these cars as being on the borderline between technology and art, examples of a design practice in which beauty was a mere accidental result of the search for extreme functionality.[3]

Other international exhibitions that had dealt with the contemporary cultural significance of technology included "Man Machine and Motion" (1955), organized at the Hatton Gallery in Newcastle, England, by Richard Hamilton and Reyner Banham, and "This Is Tomorrow" (1956), curated by Bryan Robertson and built around a main exhibit by the British artists of the Independent Group at Whitechapel Gallery in London. "Man Machine and Motion" focused on thematic displays in four chapters about techniques of mobility on land, on the sea, in the air, and in space, with quite literal illustrations of the relationship between humans and technology.[4] "This Is Tomorrow," on the other hand, showed the Independent Group artists' attempts to transpose their research about cybernetics, social theory, and popular culture into an exhibition environment that deliberately transgressed achieved conceptions of contemporary art and sculpture.

Hultén's exhibition instead sought to integrate the machine-related artworks into a broader modernist narrative, which he saw at an important crossroads due to the emergence of computer technologies. As he affirms in the dedication that precedes his catalog introduction, it was meant to be a celebration of the machine and its reflection in artistic works: "This exhibition is dedicated to the mechanical machine, the great creator and destroyer, at a difficult moment in its life when, for the first time, its reign is threatened by other tools."[5] Hultén did not, however, seek to circumscribe or define a particular notion of "machine art," a term which he uses only sparsely in the introduction or in the extensive catalog entries.

Although the exhibition dealt with many different aspects of the relationship between art and machines, Hultén reserved the denomination "machine art" for the reception of Tatlin's work by the Dadaists:

> The positions of the Dadaists towards machines varied widely. ... Heartfield and Grosz, in Berlin, soon abandoned their initial Dadaist skepticism for an almost unlimited admiration for Constructivism and "machine art."—The concepts of machine art held by the New York Dadaists and by the

> Russian Constructivists working in Leningrad in the years following the Revolution were extremely different.[6]

Here Hultén introduces the notion of "machine art" as though it were a specific concept, yet it is in fact never defined. According to Hultén,

> Tatlin was eager to put his art at the service of the Revolution. He saw the future of the new society in the development of science and industry, and he wanted his art to be a spontaneous expression of the new society's dynamism and to reflect the spirit of machine culture. ... He concluded that "the most aesthetic forms are the most economical"; but his complex thought goes far beyond this statement and involves, as he said, "art going out into technology"—the fusion of art and life.[7]

Hultén's exhibition included the 1920 photograph of Heartfield and Grosz with the sign celebrating "Tatlin's new machine art" (figure 1.1). The adjoining catalog entry vaguely references "Tatlin's ideas" about which, as Hultén speculates, the Berlin Dadaists knew very little, save for the mutual interest in "the radical overthrow of all traditional Western art."[8] In the entry accompanying El Lissitzky's collage *Tatlin Working on the Monument to the Third International* (1921–1922, figure 2.3), Hultén affirms: "Obviously wishing to further the impression that Tatlin in his machine art worked according to strict mathematical principles, Lissitzky posed him as an engineer surrounded by mathematical symbols."[9] Notably, Hultén gives currency to the expression "Tatlin in his machine art," even though he offers no argumentative foundation or references for the claim. Of Tatlin's works, Hultén's exhibition only presented a reconstruction of the *Monument to the Third International* and the *Letatlin* flying apparatus, neither of which the catalog discusses with reference to the notion of "machine art." When speaking about the theater stage designs of Liubov Popova, Hultén claims, again quite schematically and clearly harking back to the Berlin Dadaists' appropriation: "Ideas based on Tatlin's new 'machine art' predominated."[10] And he equates Tatlin's attitude with that of the Russian theater avant-gardist Vsevolod Meyerhold, whose formula Hultén quotes: "proletarization = industrialization of art."[11]

It seems remarkable that in the face of literally hundreds of artworks that deal with aspects of the machine, Hultén does not feel the necessity to define a broader notion of "machine art." He also does not employ the term with regard to the work of Fernand Léger or the New York Dadaists, even though an ample number of works by Duchamp and several of Picabia's machine paintings were included in the show. Hultén passes over Ezra Pound, ignores MoMA's own "Machine Art" exhibition of 1934, and mentions Munari's claim for an "art of machines" only in passing. Instead, Hultén sticks with the clichéd reading of the notion of "machine art" that loosely connects it to Tatlin, mediated through the Berlin Dadaists' appropriation of Umanskij's interpretation.

To complete the list, Hultén does not discuss even Jean Tinguely's works as "machine art," though they feature prominently in the exhibition and play an important role in Hultén's understanding of the "machine as seen at the end of the mechanical age." Instead, Hultén calls Tinguely's sculptures "auto-destructive and auto-creative art machines," and his

automatic drawing apparatuses of the *Metamatics* series, "art-making machines."[12] Machines can be or make art, but for Hultén, there is no particular genre called "machine art."

In addition to its historical perspective, "The Machine as Seen at the End of the Mechanical Age" also looked at the present. Some works toward the end of the exhibition, by artists including Hans Haacke, Takis, and Nam June Paik, employed new technical materials and media apparatuses and referred to recent developments, like systems aesthetics and video art. In addition, over a year before the exhibition opened, Hultén had set out the terms for a collaboration with Billy Klüver of E.A.T., then a quickly growing organization. Founded in the autumn of 1966 in the aftermath of the *9 Evenings* performance series (1966) in New York, E.A.T. was devoted to cultivating new forms of cooperation between artists and engineers. In November 1967, E.A.T. had announced a competition for artworks made in collaboration between artists and engineers, whose best examples would be included in "The Machine as Seen at the End of the Mechanical Age" exhibition at MoMA.[13] Nine of these works were shown in an appendix to the main exhibition and were also included in a special section of the exhibition catalog, printed in blue instead of black ink. In addition, more than one hundred other works that had been submitted to the E.A.T. competition were presented in the exhibition "Some More Beginnings" at the Brooklyn Museum, shown during the running period of the MoMA exhibition into 1969.

If Hultén's exhibition consciously marked the historical moment of the "end of the mechanical age," the cooperation with E.A.T. indicated his curiosity about what might come afterward. Coinciding with "The Machine as Seen at the End of the Mechanical Age," or immediately following it, were three exhibitions which pointed in similar directions. A few months earlier, "Cybernetic Serendipity: The Computer and the Arts," curated by Jasia Reichardt, had opened at the Institute of Contemporary Art in London, an exhibition which would travel to several venues in the United States and which presented examples of artists using electronic and digital technologies, exploring their aesthetic dimensions. Because "Cybernetic Serendipity" also included displays of computers, some critics sneered at it for looking like a trade fair. The second related exhibition, "Software," curated by Jack Burnham at the Jewish Museum in New York City in 1970, despite its title did not focus so much on computer art—which was present, however, in complex installations by, for example, Ted Nelson, and Nicholas Negroponte's Architecture Machine Group from MIT—but sought to promote a conceptual approach in contemporary art that was inspired by systems theory, through works by artists like Les Levine, Joseph Kosuth, Hans Haacke, and Vito Acconci. A third exhibition that had been in the making for several years, and that also involved a number of the same younger artists, was Maurice Tuchman's "Art and Technology," presented in 1970 at LACMA in Los Angeles; it was also the result of an attempt, similar to that of E.A.T., to bring artists and engineering companies together.[14]

With hindsight, it could be argued that the effort to bring an art practice that was chiefly inspired by technological change into the contemporary art mainstream—a desire that has been expressed by artists and curators of electronic and digital media art for over forty

years since—already failed at this early moment. It failed technically—as could be witnessed in Burnham's accident-ridden show—and it failed, more importantly, with regard to the inscription of such work into art historical narratives. In the same year, the Museum of Modern Art in New York staged the exhibition "Information" which, organized by MoMA curator Kynaston L. McShine, displayed technical vehicles and office machines on its catalog cover, but the show itself did not so much engage with the social meanings of technology as lay the foundations of a conceptual art that did not seem to require a critical reflection on the information technological paradigms it grew out of.[15]

With a few exceptions of artists who, after 1970, adapted to the rules of the contemporary art field—like Paik, Haacke, or Tinguely—computer or media art at best remained the addon that it had been to Hultén's "Machine as Seen" exhibition. Later examples—like the two Paris shows "Electra" (1983) and "Les Immatériaux" (1985), or the exhibits accompanying electronic and media art festivals since the late 1970s—cemented the detachment of media art from contemporary art, a detachment that has throughout been signaled by the marker of an affirmative approach to new technologies.[16] Importantly for the context of a "machine art," Harald Szeemann's exhibition of the "Bachelor Machines" (1975–1977, presented first in Venice, and then in Brussels, Düsseldorf, Paris, Malmö, Amsterdam, and Vienna) focused attention on Marcel Duchamp and the symbolic conception of the machine that had inspired the *Large Glass* (1915–1923). Concomitant with the introduction of Deleuze and Guattari's philosophical concept of the "desiring-machines" in their *Anti-Oedipus* (1973) around the same time, it became possible for art and culture critics to speak about "machines" without referencing contemporary technology.[17]

The present study cannot do much to change this weathered terrain. It will suggest inscribing a number of more recent art practices that have critically engaged technology or the cultural significance of technological systems into a narrative that in Hultén's exhibition ended in the late 1960s, but that—this is the thought experiment proposed in the following chapters—could be extended at least up to the end of the twentieth century. This extension is possible both because of the latency of the historical "machine" beyond the supposed "end of the mechanical age," and because of its reconfiguration, rather than supersession, around the very period that Hultén proposed as *machine terminus*.

Chapter Summary

After its historical preludes, Hultén's exhibition proper begins with the eruption of machine motifs in the art and poetry of Italian futurism at the beginning of the twentieth century. In order to better understand what amounts to no less than a foundational myth for the avant-gardes of the 1910s and 1920s, and for the artists working in their footsteps later in the century, we will leap backward in time and reread the story with which Filippo Tommaso Marinetti prefaced the publication of the first futurist manifesto in 1909. The remainder of this chapter provides an outline of the five key aspects of machine aesthetics (associative,