

Postindustrial Studio Lifestyle

The Eameses in the Environment of 901

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The short film “901: After 45 Years of Working” (1988) features a lengthy tracking shot into one of the more unconventional film studios of the mid-twentieth century—the Eames Office, located at 901 West Washington Boulevard in Venice, California. The Steadicam takes us from the street outside and the building’s unassuming facade, through the front door, and into the open design and production space of the studio’s flexible interior. As the camera floats, tracking forward and backward through the superabundant space, it pans and tilts, allowing us to appraise all manner of now-empty Eames furniture, designed over the course of the studio’s working life, often on-site. The furniture sits among other evidence of past, now-abandoned work product still hanging on the studio’s walls as the iconic, lasting yield of the Eames Office’s research program. Love at last sight.

The film’s occasion was the death of Charles’s design partner and wife, Ray Eames, who stipulated that the teeming contents of “901”—as the Eames Office became known—be catalogued, boxed, and then shipped to various museums and archives. The melancholy shot appears late in the film, which was made by Eames Demetrios, Charles’s grandson, as a kind of elegy to the life in work contained by this creative environment. It’s a knowing enactment of Charles Eames’s long-standing commitment to what he called, borrowing from Buckminster Fuller, the “feeling of security in change.”¹ The well-engineered fluidity of the long take performs temporal continuity as an homage to the studio’s long and storied life, which has come to an end, its material remains now en route to the Library of Congress. We see this more transitory process in several shots of accelerated motion, one of the Eameses’ own recurring filmic techniques. Speedy sorting and packing are the film’s formal nod to the style, and lifestyle, of the Eameses’ own early furniture

films—their way of commenting on the time of work, of media, and of creative work in media.

The Office may have ended in the archive, as information and accumulated research product, but 901 began in the brave new object world of plywood—first at war, then converted to the stuff of postwar domestic comfort. The studio was also born at the historical moment when the function of the designer, sparked by wartime mobilization, expanded from the making of consumer objects to participation in the creative, knowledge-based, information-saturated operations of a nascent postindustrial society.² This change placed 901—and the more than one hundred films the Eameses made there—at the heart of the Eames Office’s postwar investigations into education, its experiments in the communication of information and ideas, and what John Harwood has called its “sustained interdisciplinary research conducted in tandem with the central scientific institutions of the postwar period, public and private.”³ Over the course of the Eameses’ career at 901, this ever-widening research agenda included work for IBM, the RAND corporation, ARPA, the Westinghouse Electric Corporation, and various governmental bodies and institutions: the United States Information Agency, the Departments of State and the Interior, and the Smithsonian, to name just a few. In this way 901 was also implicated in what Caroline Jones and Peter Galison have identified as a broad shift in the postwar studio from the centralized “aggregative and social mode of production” of work of the wartime factory to a decentralized, dispersal of production “among multiple authors at multiple sites” and in “the spectacular and discursive realms of print, film, and photographic media.”⁴

In this essay I approach 901 as a studio environment for the kind of tech-savvy, postwar production that, for the Eameses, constituted happy, creative living in the mid-twentieth century. Eamesian happiness has been understood as one of the period’s more powerful normative horizons for orienting consumers at home and abroad toward designed objects and “ways of life” that circulated—as did images of the studio lifestyles of the Eameses—as signs of the postwar good life. I’ve argued elsewhere that Eamesian happiness is more instructive as a model of production, a medial and technical process of working with objects and images, than as the reified promise of any particular good.⁵ The logic of production informing the Eameses’ design practice requires a more fine-grained account of the technological and scientific environments of the postwar period in which they worked. These environments radically transformed what seemed taken for granted or “natural” in the unfolding of the good life. And the film studio, of course, was one such technical environment—as excellent materialist film history by Brian R. Jacobson and others has recently argued.⁶

The environment in and around 901 during the studio’s forty-five years of operations was, in its origins, devoted to experimental plywood manufacture during the war. It was the site where that technomodel of postwar nonnature—the

plywood chair, announced to the world as “the Eames chair” in March of 1946—was researched and developed, prototyped, and filmed in a collaborative, democratic atmosphere of wartime interdisciplinarity. I say “in and around” because one of the axioms of Eamesian production—amply borne out in plywood’s contemporary media culture—was its sheer extensivity and promiscuity. Such making refused to be contained in one space, or practice, or medium, or discipline; it insisted that *all* spaces of creative life and making are studio spaces.

Many of the Eameses’ films have a way of announcing this fact. Consider *Kaleidoscope Shop* (1959), produced after 901’s laboratory of wonder had become famous internationally. When Charles was invited to give a lecture at London’s Royal College of Art, and asked to offer an illustrated tour of the Eames Office, he responded with a visual surrogate for 901’s relentless productive activity. Charles’s four-minute film dissolves a site of organized collective production into play and sensation, asking the tourist-spectators to see work by looking through a toy: here, a kaleidoscopic camera that Charles built at 901 with the help of Parke Meek and Jeremy Lepard. Graphic layout room, film editing room, conference room, darkroom, furniture shop—all the spaces of the Eameses’ wide-ranging media practice are presented to the viewer as part of a relentlessly active visual field in which the eye, like these designers, never rests. In asking us to view their kind of creativity through dispersed, technically fabricated views of a famous office-turned-playground, the Eameses announce their design practice and its material infrastructure as a studio *lifestyle*. In it, filmic experimentation becomes play, and both are embedded in the times, speeds, and sensations of postindustrial production and its quasi-utopian transformations of the spaces of private life, its reworking of the boundary between leisure and work.⁷

This lifestyle is most associated with 901 and the broader artistic and political ferment of wartime Los Angeles. But as I will argue, 901’s studio environment had multiple determinations. Its far-flung sources of cultivation stretched from suburban Detroit to Hollywood, and its models included new kinds of things and people, from molded plywood and compact sofas to computers and Billy Wilder, an Eames intimate and, for them, an exemplary studio professional. As the material infrastructure for the more intangible shape of postindustrial lifestyle itself, 901 came to embody a flexible mode of work—of creative, corporate production; it was a node in a network that extended beyond the Eameses and the talented, increasingly numerous members of the Eames Office staff. This essay’s approach to 901 as a studio, therefore, moves centrifugally, thinking outward from the various studio environments, scales of studio production, and media cultures that the plywood chair, and the lifestyle it materialized, seemed to require, as the chair’s increasingly famous designers found themselves more and more working and living in all manner of studios. In the process the Eames Office produced films that allegorized the conditions of the studio environments that made them—and indeed, that remade life in the mid-twentieth century itself.

PLYWOOD'S STUDIO CULTURES AND THE BIRTH
OF POSTWAR DESIGN

The journey of 901 from garage to factory to laboratory to world-famous design studio began after the honeymooning Charles and Ray Eames moved to California from the Cranbrook Academy of Art in the summer of 1941 with a plan to mass-produce the plywood furniture designs that had won Charles and Eero Saarinen awards in MoMA's famous "Organic Design in Home Furnishing" competition in 1940–41. At Cranbrook the Eameses were first encouraged to understand filmmaking and furniture experimentation, plywood and celluloid, within an intermedial and interdisciplinary design practice (Fig. 8.1).

A telling photograph of Charles at Cranbrook, taken by its Photography Department, features Eames seated on an armchair prototype for the MoMA competition. The image insists on the experimental proximity of mechanical recording media and plywood furniture through a superimposition that dissolves, organically, human into technological form. At Cranbrook Charles worked in furniture design, film, and exhibition design simultaneously, but also collaboratively, and within the broader communicative agendas of the esteemed educational institution that employed him, and he had quickly learned the lessons of the PR revolution.⁸ Eames tended to refer to the administrative unit he led at Cranbrook as the department of "experimental design," and he made repeated trips to László Moholy-Nagy's School of Design in Chicago to consult with the Bauhaus master on the scope of a vanguard pedagogical practice. At the school this included film, and so, too, at Cranbrook. In 1939 Charles produced *Academy Film*, his first work of useful cinema and, effectively, his first sponsored film, designed to promote and publicize the educational activities and aesthetic aspirations of the Academy of Art. He followed this with footage assembled as *New Academy Movie* (1941). The film documents a range of student activities, visiting speakers like Frank Lloyd Wright, and esteemed faculty like ceramicist Maija Grotell, whose studio process of happy, expert making is shown in admiring close-ups of the shaping and firing of a series of vases. The film's subjects are design objects and practices, from Grotell's ceramics or Eliel Saarinen's tea urn to Eames and Saarinen's chair prototypes. This preoccupation with studio process extends, of course, to Cranbrook itself—its campus a living collection of studios and an object of total design, and its educational mission and abiding lifestyle overlapping design processes demanding communication. The film concludes with a sequence featuring an exhibition of student work across media: textiles, painting, sculpture, photography, and photomontage. In the process it enacts film's own exhibitionary power as a medium about media, materials, and the studio environments that put them to use.

As an assemblage of bodies, tools, and techniques, 901 emerged in Venice in the early 1940s at the locus of the intersecting itineraries, social networks, and agendas



FIGURE 8.1. Charles Eames superimposed in an armchair prototype, June 1941. Courtesy Cranbrook Archives, neg. 5702-1.

of various studio personnel and practices. These agendas and actors operated at various scales, extending from the experimental Cranbrook classroom to the sets and locations of the Hollywood majors and, beyond that, to theaters of global war. Moving from Michigan to Los Angeles, Charles took a job as a set designer at MGM and worked for several months for the studio's legendary art director Cedric Gibbons as a draftsman on *Johnny Eager* (1941), *Random Harvest* (1942), *I Married an Angel* (1942), and *Mrs. Miniver* (1942). A midwesterner with no friends in California, Charles made his first connection to the Hollywood studio system through Cranbrook sculptor Frances Rich, the daughter of film and radio actress Irene Rich. With Eero Saarinen and his wife, Lily, Charles had in fact visited California to design a studio for the sculptor, with whom he was said to be romantically involved, in 1940. It was Frances Rich's close friendship with Katherine Hepburn

that Eames traded on when he contacted Hollywood agent Leland Hayward (Hepburn's erstwhile lover) about a job with MGM.

For Eames, the gig in MGM's prestigious dream factory would be short-lived, a steady paycheck as he and his new (second) wife, Ray, pursued the experimental promise of molded plywood from the makeshift home studio of their Richard Neutra-designed Westwood apartment. Let's consider Charles's MGM day job as an encounter with another studio environment caught up in epochal change. As Jerome Christensen has argued, with a signature production like *Mrs. Miniver*, MGM was not just serving up a well-crafted story of a middle-class British family's fateful involvement in World War II.⁹ In the wake of the 1940 Consent Decree, *Mrs. Miniver's* war-mobilization plot constituted an artful, morale-building studio allegory of MGM's own claim to continued excellence in the uncertain postwar future of Hollywood's oligopoly. Read as a work of anticipatory planning, *Mrs. Miniver's* narrative affirmed the inevitability of choice in liberal society, linked liberal-democratic choosing to styles of consumption, and positioned the studio's abiding commitment to quality as best equipped to handle potentially threatening postwar change—here, “in the conditions of production, distribution, and exhibition.”¹⁰ Security in change. The responsibility to choose. Commitment to goodness. Eamesian lessons, all.

Eames may have readily understood Metro-Goldwyn-Mayer's corporate allegory, since he was, at night, in his home studio, performing his own commitment to quality and making a similarly risky wager on postwar styles of consumption and taste—not in the goodness of film, but furniture, another product of studio magic. In his apartment's spare bedroom, Eames constructed a homespun contraption for prototyping and refining the plywood molding processes that he had begun at Cranbrook with Saarinen and designer Don Albinson. Because of the transformative wonders it worked in wood veneer, Eames dubbed it the “Kazam! Machine,” scaling down the standard wood molding technologies then finding wartime applications in the aerospace industry.¹¹ MGM by day, Kazam! Machine by night (and early mornings!): in 1941 the Eameses moved from one studio environment to the next, inaugurating a pattern of a life in work that would become typical in the years to come.

The couple lived in the Westwood apartment for the next eight years, before moving in 1949 into an eventually more-famous home of their own design—Case Study House No. 8. It included, across a small courtyard from the home, a one-thousand-square-foot studio in a separate, two-story building, with storage and sleeping space above and a bathroom and darkroom below. Eames and Saarinen's accompanying briefs for Case Study Houses No. 8 and 9, respectively, enshrine the very logic of efficient modern spaces, in which one lives and produces in time and media, that the Eameses had first enacted by living with the Kazam! Machine: “‘House’ in these cases means center of productive activities.”¹² The Eameses are

described anonymously in the brief as “a married couple both occupied professionally with mechanical experiment and graphic presentation”; this requires an environment in which “work and recreation are involved in general activities: Day and night, work and play, concentration, relaxation with friend and foe, all intermingled personally and professionally with mutual interest.”¹³ In the Eameses’ house, as in their Westwood apartment that preceded it, play dissolves into work, work is the stuff of enjoyment, and professional and personal investments blur in the domain that Charles Eames dubbed “serious pleasure.” The house itself—as an envelope for living—becomes an unobtrusive stage or frame for a lifestyle in which everything is interesting.

The key mediating figure between these two Eames homes (and home studios) was erstwhile MGM writer John Entenza, who had just purchased and begun to reinvent the small lifestyle magazine *California Arts & Architecture*, formerly a “genteel regional publisher of homes, gardens and theatre reviews,” as the Eameses arrived in Los Angeles.¹⁴ A committed liberal, Entenza had worked in an experimental film production unit at MGM in the late 1930s under Paul Bern and eventual blacklist victim Irving Pichel. Throughout the wartime period, and into the nascent postwar heralded by *Arts & Architecture*’s Case Study House program, Entenza was Charles Eames’s most fervent promoter and most reliable source of financial support. He was also Charles and Ray’s gateway to LA’s thriving art, architecture, and design communities featured in the magazine, which fomented its own plywood culture. Entenza constituted the link between plywood’s industrial development as revolutionary material—molded in the technical objects at 901 whose sophistication increasingly outstripped the Kazam! Machine—and *plywood as image*, a more intangible harbinger of a postwar Eamesian lifestyle distributed in a variety of media platforms: first print and photography, then film and television.

A twelve-thousand-square-foot former garage located in an industrial area of Venice two blocks from the Pacific Ocean, 901 began its storied life as the home for the Evans Products Company’s expanded wartime plywood manufacturing, which came to include the Eameses’ revolutionary designs. Its location was scouted by one Norman Bruns, an electrical engineer who came to Evans via the Lockheed Corporation at Burbank, where he worked on the support team for P-38 fighter planes. Bruns was introduced to the Eameses through Entenza, and his contacts in the aerospace industry gave Eames access both to technical information from the industry, crucial to his plywood research and development, and to materials restricted to noncivilian use during the war, without which the Kazam! Machine would have no magic.¹⁵

Plywood’s demand soared during the metal shortages of the global war. Months after the US’s entry into the conflict, Eames quit his job at MGM in the summer of 1942 to devote his energies to this experimental material, and the navy eventually ordered 150,000 molded plywood splints from his recently established Plyformed



FIGURE 8.2. Molded Plywood Division staff members with a blister for a glider nose section.
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Wood Company (fig. 8.2). Formed in late 1942, the plywood “cooperative” (as it would be initially understood) included Entenza, the socialist architect Gregory Ain—a friend of Entenza’s invited into the group for his engineering expertise in the building of plywood molding machines—and two of Charles’s associates at MGM: Griswold Raetze, one of many US architects who found employment in the Hollywood studios during the Depression, when commissions were scarce; and English set designer Margaret “Percy” Harris, who left London in 1940 to find work in the United States. In 1943, to help scale up production, that original company moved into 901 as the Molded Plywood Division of the Evans Products Company. During the war, 901’s two-hundred-dollar-per-month lease was paid by Evans, the first manufacturer of the Eameses’ plywood furniture before Herman

Miller began marketing and distributing it, and eventually took over its manufacture in 1949. Evans's Plywood Division also included crucial personnel from Cranbrook's studios: first, the wood sculptor Marion Overby, whom Charles had met in Carl Milles's sculpture studio, and pressed into the war effort; then, from the metal studio, Italian sculptor Harry Bertoa; and later, in 1946, following his stint in the air force, Cranbrook alumnus Don Albinson. And from 1943 to its dissolution in 1946, the Plywood Division also drew extensively on the talents of the celebrated Swiss designer and photographer Herbert Matter, the Division's "in-house staff photographer and darkroom technician" and the figure most responsible for the visual documentation of the wartime plywood experiments.¹⁶ Having worked as a fashion photographer for *Harper's Bazaar* and *Vogue*, Matter was well-positioned to preside over plywood's swift conversion from experimental object to postwar glamour image in *Arts & Architecture* and elsewhere.

Plywood was 901's first interdisciplinary object. Drawing on technical expertise from the domains of sculpture, art, architecture, graphic design, engineering, the military and aerospace industries, electronics, metallurgy, set design, fashion, film, and photography, the Plywood Division exemplified the kind of collaborative, research-driven activity, "enriched by an exotic mix of disciplines," that typified 901 throughout its working life as a studio.¹⁷ While the term *interdisciplinarity* had emerged in the 1920s, it matured as a practice in the forms of collaboration and communication demanded by wartime mobilization.¹⁸ It would enjoy its heyday in the Cold War period of the designer's newfound global prestige, when the idiom of "design" took on a larger and more expansive meaning, often becoming a kind of shorthand for managing, and providing security within, change itself. Whether practiced at 901 and RAND or enshrined in period-specific theories of general education and late-Bauhaus aspirations toward holistic training across media, both of which decisively shaped the Eameses' media practices at 901, interdisciplinarity became a crucial Cold War habit of mind.¹⁹ It was defined by the putative "democratic" character traits of tolerance and open-mindedness, nonconformity and creativity, and especially "flexibility": the capacity to cope with complexity and ambiguity and to find security in change.

In the case of the Eameses the key disciplinary solvent was "communication," a centrifugal domain encompassing the wartime study of information-handling, propaganda, and the mass media. Communication's period-specific prestige in influential interdisciplinary assemblages like the Rockefeller Foundation-funded "Communications Group" led to the consolidation of mass communications research as a social-scientific discipline, and the first PhD programs in Mass Comm, but also to a redrawing of the parameters of the Eameses' design practice at 901.²⁰ In the early years of 901 the most obvious instance of this investment was the film *A Communications Primer* (1953), an illustration of postwar communications theory based on Warren Weaver's introduction to Claude Shannon's *A Math-*

emational Theory of Communication (1949). But the indifference to disciplinary propriety evident in the transdisciplinary aspirations of cybernetics is also apparent in the galley proofs of an ad for the film *A Communications Primer* in the Eames Collection at the Library of Congress that cross-promotes the film with the plywood furniture group: “Low cost chairs designed by Charles Eames will quickly turn your selling floor into a center for universal modern seating.” Presumably targeting furniture dealers, the advertisement betrays the inkling that the stuff of modern furniture and au courant theories of information processing might share a similar logic or partake in the same aspiration toward universality or boundary-crossing interdisciplinarity. This, we might say, was a postwar lesson anticipated by the Plywood Division at war.

This compressed wartime history of 901—linking factory, lab, and design studio—reminds us that plywood’s interdisciplinary world was not limited to Evans’s machine shop but overlapped significantly with the media-savvy environment of wartime and postwar Los Angeles, with the personnel of the film industry, and with liberal technophilic visions of a happy postwar future. Plywood experimentation was always part of 901’s broader terrain of media practice. In the Eameses’ case the proximity in LA of machined wood and modernist media experimentation in a visionary program of arts integration was most evident in the pages of *Arts & Architecture*. Entenza’s magazine played a pivotal role in the articulation of a California modernism with speculative designs on the future and abiding technologies of the postwar good life most famously in its sponsorship of the Case Study House program.

In *Arts & Architecture*’s September 1943 issue Ray Eames made her own pitch for plywood’s centrality in the integrated technoaesthetic terrain later dubbed the “new subscape” by George Nelson, who would hire the Eameses in 1946 in his capacity as director of design for the Herman Miller Furniture Company.²¹ Preceded in the magazine by an ad for the George E. Ream Company promoting “Plywood For War . . . Later For Peace,” Ray’s photomontage depicts an Eames chair in an expansive terrain of production, including works of painting (Picasso’s *Guernica*) and sculpture but also oil derricks, military helmets, contemporary skyscrapers, airplanes, and the reels of a film-editing table.²² The collage is accompanied by a short prose manifesto that announces a contemporary aesthetics “influenced by the world in which we live and by the synthesis of the experiences of the world by all creators,” including “the engineer mathematician physicist chemist architect doctor musician writer dancer teacher baker actor editor the man on the job the woman at home and painters.” In the September 1946 issue the Eameses’ own plywood furniture designs were treated to a lavishly illustrated twenty-page feature, written by Eliot Noyes. It contained a number of stunning illustrations by Matter. Within the magazine’s liberal editorial vision of integrated arts, Noyes’s gushing account of the inspired democratic vision of the Eameses’

furniture was prefaced by Entenza's own column insisting on the power of the citizen's vote in the country's upcoming midterm elections.²³ It also shared space with Robert Joseph's "Cinema" column—here about the US Office of Military Government's recently finished concentration camp documentary *Die Todesmühlen/Death Mills*. Joseph's praise for this landmark work of German political reeducation, much of it done by Billy Wilder at the Film Section of the Information Control Division, summons the power of US propaganda in "all mediums of communication—radio, theater, newspapers, magazines, books and motion picture films" to "acquaint the German people with the horror of these terrible murder factories."²⁴ Its communicative aspirations lodged between technologies of mass death and techniques of postwar happiness, the media culture of Eames-era plywood in 1946 was wildly capacious.

S-73 | POSTINDUSTRIAL STUDIO LIFESTYLE

The 1946 feature in *Arts & Architecture* precipitated the breakup of the interdisciplinary plywood cooperative that same year. For some members its "great man" account of plywood prototyping and production marked a betrayal of the collective's founding commitment to shared credit and profits.²⁵ The Eames Office proper came into being at 901 shortly thereafter, in 1947, when Evans Products moved its plywood manufacturing operations to Grand Haven, Michigan, allowing Charles to create a studio first called "The Office of Charles Eames" and staffed in part by a few remaining members of the Plywood Division. In 1950, after having opened a Los Angeles showroom (designed by the Eames Office) the previous year, Herman Miller established a West Coast manufacturing plant and assumed the lease on 901, relocating its factory operations to the front and rear sections of the building, where the Office designed and produced the Eames Storage Units (1950–53), the fiberglass plastic armchair with Zenith Plastics (1950–53), the wire mesh chair (1950–53), the Sofa Compact (1954), the Eames lounge chair and ottoman (1956), and much more. From 1950 to 1958, 901 housed some three dozen employees of Herman Miller and the Eames Office, described by one Eames associate as "all comingled in an energetic, mutually interdependent, cooperative, and democratic mix of designers, clerical and management personnel and factory workers." Accounts of the atmosphere of 901 by its talented staff and visitors describe a space of wonder: "like a film set," one staff member observed, "901 possessed an informal and almost magical quality quite different from the quietly restrained design offices of the period"²⁶ (fig. 8.3).

While Charles Eames happily wrote of being able to leave MGM in 1942 to focus on the work of furniture design, he wasn't so much leaving the film studio as he was beginning to reconceptualize its Fordism within a culture of postindustrial image production and consumption. As a physical space whose plywood products had just begun to find a vanguard audience and international distribution as tech-



FIGURE 8.3. Eames Office staff, working at 901. Dec. 1951. © 2017 Eames Office LLC (eamesoffice.com).

nically mediated objects and images, 901 remained a modest, unassuming building with brick walls, a concrete floor, and no architectural distinction whatsoever. It was nonetheless a studio in the process of transformation and expansion. But perhaps “expansion” is too mild; it doesn’t capture the explosion of experimental activity within what Catherine Ince has described as the Office’s dual “condition as both shop (in the American sense of the word) and studio set.”²⁷ Film—like photography—was at the heart of 901’s wide-ranging design activities across media as of 1950, when the Eameses made their first, unfinished film, *Traveling Boy*, with a camera borrowed from screenwriter Philip Dunne.

Indeed, 901’s ambitions to be a *film* studio, specifically, grew as the Eameses’ interdisciplinary interests in communication expanded over the course of the 1950s and 1960s. “More and more,” Charles remarked in 1957, the Office “has come to be concerned with the way information is handled.”²⁸ This meant increasingly



FIGURE 8.4. Eames Office staff, at 901 on the set of *Introduction to Feedback*, 1960. © 2017 Eames Office LLC (eamesoffice.com).

more of 901's work was spent on the production of films, graphics, and exhibition design, pursuits that "eventually eclipsed furniture design and production as the principle [*sic*] office activity" in the 1960s and 1970s. This reorientation from the domain of objects to images, information, and knowledge work was fully under way by the end of the 1950s, following the Eameses' IBM-sponsored film *The Information Machine: The Creative Man and the Data Processor* (1958), made for the IBM Pavilion at the Brussels World's Fair, and its famous multiscreen experiment in informatic saturation *Glimpses of the U.S.A.*, commissioned by the USIA for the American National Exhibition in Moscow in 1959. As both a sign and catalyst of this change, Herman Miller moved its California offices from 901 to Culver City in 1959, an office reorganization that freed up more studio space for film production. By this time, all of the film production was done at 901; the office had subsumed for the Eameses many of the functions of home and studio.²⁹ A representative shoot is captured in a photograph of the Eames Office staff on the set of *Introduction to Feedback*, the IBM-sponsored sequel to *A Communications Primer*, which appeared in a 1959 feature in *Vogue* (fig. 8.4). The next, and final, major change to

the physical space of 901 came in 1971, with the construction of a two-story building to house the models and work product for the large exhibition *A Computer Perspective*, also for IBM. Following the exhibit, the structure became a dedicated shooting stage and slide area, and its balconies held the “overflow of objects, film storage, and records from the main building,” now fireproofed.³⁰

If 901's studio interior thus bore the traces of the Office's increasing embeddedness in the rhythms of postindustrial culture and its modes of media production, the foundational condition of this environment was postindustrial *flexibility*, its most prominent structural feature. “Magic” and “wonder” were secondary affects that followed from the studio's more primary architectural receptivity to relentless change. The otherwise unremarkable interior of 901 was a fully demountable space, subdivided by Celotex panels attached temporarily to the old garage's wooden bowstring trusses above by c-clamps. This reliable old technology became the binding stuff of vanguard interdisciplinarity, as 901's layout changed often between 1943 and 1978, remaining ever ready for new spatial configurations to suit the specifications, necessary personnel, and collaborative activities required of any given job. In this rough-and-ready way 901 materialized the recombinatory principles of many of the Eameses' furniture designs and toys such as *House of Cards* (1952) and the *Revell Toy House* (1959). But it also served as a “heuristic environment”—embodying the normative conditions of work and play, knowledge production, and creativity, as an endlessly iterative feedback-driven process of problem-solving within conditions of constant change.³¹ In its flexibility such postindustrial studio lifestyle performed “the feeling of security in change,” the affective condition that Charles Eames called—again summoning Bucky Fuller—the most important product that any education can provide.

These conditions were addressed in the IBM commissions, most obviously, but also in 901's less-well-known sponsored films for Herman Miller, which united postwar objects and moving images in an overtly pedagogical agenda. The furniture, like the films made about them, were studio products but also midcentury allegories of flexible production.³² In fact, the Eames Office films often implicate its furniture's materiality—plywood, fiberglass, steel, aluminum—in expansive technical environments that extend both to their films as canny, self-aware technologies of postwar modernity and to filmmaking itself as a mode of participation in the communicative, systems-oriented work of a nascent information society. Because this lifestyle required studio practice, we should not be surprised to find in the furniture films the flexible creative environment of the studio itself.

Take the couple's first surviving film about a furniture design, *S-73: Sofa Compact*, one of eight works of nontheatrical, “useful” cinema made for Herman Miller between 1954 and 1973. The film was made to explain the design and function of the Eames Sofa Compact to Herman Miller's sales force, dealers, and merchants. Like other Eames films, it was also screened at Herman Miller showrooms, which

blurred film exhibition and product display in movie nights featuring the designers' work. The Eames Office, beginning with a seemingly modest film like *S-73*, was not only teaching its client—and its client's clients—how to use this piece of furniture; in fact, it was enacting how the filmic apparatus itself might be put to corporate use as a flexible communicative device, its technological mobility basically of a piece with the film's ostensible subject. From the start, the film *S-73*'s future life of exhibition and display is conceptualized as a kind of metapedagogy in a corporate circuit extending from Herman Miller's production and distribution networks to their own clients, who can show the film to their own sales staffs.

The film's opening montage frames the sofa's compact design as the materialization of the solution to a problem in and of modern systems—the problem of shipping as both the manufacturer's responsibility and the “designer's problem.” The film's graphic play with boxes of various kinds—trucks, trains, cubes, packages, and grids stretching from floor tiles to living-room drapes—announces its position at the dawn of “containerization” itself—the mid-1950s standardization of shipping containers and the transformation of freighting from the “break-bulk” method to the aggregation of cargo into identical, corrugated steel boxes that could be moved directly from ship to truck or train. The film thus comments on the extension of modularity as a principle of furniture design and production to its equally flexible networks of distribution and their traffic flows.

As an exploration of postindustrial lifestyle, the film turns from boxing to unboxing, from questions of distribution to the product's “life of service” in the hands of the consumer. Now, the film performs its pedagogical lesson about the handy assemblage of the sofa by showing its “de-compacting” by two “average couples,” and *in two speeds*—fast and slow. First, through the filmic magic of stop-motion (scored to classical music), one couple puts together the sofa in a snap. Then, “a couple less experienced in such matters” takes “a little longer.” We need to see the decompacting twice because in being repeated, it communicates itself as a variable *process* of becoming acclimated to a system of new equipment for modern leisure with which couples can be more or less “experienced.” To master this habitus, we will need to go through the motions, perform the requisite gestures, build the kit more than once. But we also see in the two iterations of assembly how the Eameses link the *S-73*'s feats of compacting and decompacting to film's own capacity for temporal compression, abstraction, and elongation in forms of duration. The film is the first in a series of the Eameses' attempts to think together the mobile time of modern furniture and the times of moving-image technologies, and beyond that, the broader forms of “space-time compression” that are the hallmark of a postindustrial society of consumption oriented toward a “life of service.”

Against these forms of temporal compacting, *S-73* also works to thicken or stretch the time of this sofa by embedding its time- and money-saving design solution in a longer history of care and planning, thought and experimentation—

which is to say, in 901's environment of happy making. As if anxious to correct the misperception about creative authorship fomented in the wake of the Plywood group's collapse, S-73 works to materialize the value of human labor and scenes of production that have informed it. As Eames's voice-over insists that the S-73 is a "product that is the result of much thought and research on the part of the designer," we cut to a close-up of a smiling Charles, eyes closed, resting his face on the seat of the sofa and then to a fast-cut series of seven close-ups of the faces of various members of the Eames Office involved in the longer history of this product's manufacture. The lesson, humanized by the faces of studio labor, is a kind of design flashback that chronicles all the "problems and decisions that go with planning and preparing a product for production," including some of the important mock-ups and models" of S-73. Embedding the sofa in collective work of its planning in this way also nods to another peculiarity of 901 as a design studio: by keeping the furniture workshop and machine shop in the back third of the building, 901 maintained an unusually close, organic proximity between model and prototype production and the design process.³³

Continuity of design process, the film insists, coincides with flexibility, in both the sofa's making and its future uses. In fact, the final segment of the film makes clear that this seat—and its abiding time—isn't really for lounging. Instead, the S-73 exemplifies a more restless, mobile time, as we see it featured in a sequence of different environments: a dentist's waiting room, an art museum, and airy living room, facing a TV, where a sleeping housewife is roused from her slumber by her son. The scene clarifies S-73's suitability for brief moments of *vulnerable repose*—the time of waiting rooms, bourgeois leisure, a housewife's interrupted catnaps. The film ends with the wish for a kind of long-lived happiness of the sort the S-73 can provide, but it has labored to show us that this temporal continuity of "service and pleasure" exists alongside the other, more vulnerable times of the midcentury media environments materialized by the sofa: the abstract time in which it is boxed and shipped, the habit-forming time of domestication it takes to incorporate this new technology into one's lifestyle, the time of labor that produces it, the downtimes between what counts as eventful in one's day, even the press of contingency that only synthetic upholstery can manage. "There is no predicting what may happen in the life of a sofa," Eames's voice-over observes. The S-73, like 901 itself, materializes the conditions of security in change. Carving out any time for leisure, and the designed spaces of restive repose that allow us to take pleasure in it—this, S-73 clarifies, takes work: it calls for logistical control, discipline, and predictive capacities. When does the life of service begin and end? Do designers ever sleep? In asking these questions, S-73 is less a chair or a film than a plea for systematicity, for better modes of time management. Beginning with the box, the grid, and the shipping container, it is a film not just about a sofa but about that broader and largely neglected category that John Durham Peters has dubbed

“logistical media”—media that “organize and orient,” that “arrange people and property” into time and space; it attests to the place of flexible sofas and speedy film production at 901 within what media historian Alexander Klose calls the ascendancy of “the container principle.”³⁴

S-73 demonstrates that the Eameses had begun to think hard about the relationship between modern furniture, filmic time, and the postwar incursion of television into the domestic interior that would, in fact, prompt the broadcast of their first furniture film. In the film’s concluding vignette the S-73 finds itself in a living room reoriented around a television set, which it faces. The momentary pleasure the sofa offers to the napping mother seems to depend on both mom and TV being, for a time, turned off, removed from broadcast television’s ongoing space of abstract flows. S-73’s way of bringing flexible modern furniture and TV together is canny, since a rising cultural fascination with the Eameses’ furniture and its lifestyle provided the couple access to the television studio itself. The best-known instance of this came when the Eameses unveiled their famous lounge in a charming two-minute Herman Miller promotional film, *Eames Lounge Chair*, broadcast on April 14, 1956, as part of a lengthy spot on NBC’s lifestyle show *Home*, hosted by Arlene Francis. But the couple had made their television debut several years earlier on *Discovery*, a public-service program on *Creative Arts Today*, sponsored by the San Francisco Museum of Art and broadcast on station KPIX in December of 1953. Producer Allon Schoener pitched to Charles a program on furniture design, apparently, in which Eames would “explain the evolution of some of [his] designs, demonstrate their uses, and possibly include a film section showing how they were made in the factory.”³⁵ With “no experience with television,” Eames warmed to the notion of using prefabricated filmed modules as stand-alone “answers” to questions posed to him on-air by the program’s emcee: “from what I hear,” he wrote, “it might be best to get a certain amount on film and avoid studio panic.”³⁶ Sending Eames a rough outline of the program, Schoener insisted that the filmed material—however much it allowed the Eameses control over the show’s content—not betray television’s essence as “carefully planned and rehearsed spontaneity.”³⁷ He thus cast the show as both an experiment in itself and a kind of summation of Eamesian research and development: the program, Schoener insisted, would be “much more interesting if you felt it could be your own presentation and the result of your experiments”³⁸—from one studio to another.

Schoener’s initial request for a film about the making of the Herman Miller furniture—a short, lost film about the molded plywood chair titled “Chair Story” in the program’s drafted script—precipitated the inclusion of several filmed modules: an animated sequence illustrating some principles of design evolution; a two-minute film labeled “Toys, Other Designs” in the script’s final version; and two filmed sequences of stills shot in and around the couple’s already-famous home in the Pacific Palisades—material later recombined into *House: After Five Years of*

Living (1955).³⁹ Ostensibly about furniture design as a creative art, the TV program effectively showcased, while expanding, the studio-based terrain of the Eameses' media experimentation. Within it, the processes of making a toy or a chair, or filming its manufacture, or broadcasting that activity on television connote the same mobile, happy studio lifestyle enacted in the couple's modern home. "Chair Story," then, is both a film about the revolutionary processes of molded-plywood manufacturing and a testing ground—like the TV appearance itself—for the Eameses' ongoing, overtly communicative experiments. It is one part of a flexible, studio-based media kit. While the *Discovery* program may have featured furniture designs, those designs were, within the context of the Eameses' contemporaneous interests in television, already folded into a broader, multimedia pedagogical practice in a network of studios, with 901 its central node. In it, their films would be explained to the TV audience as "the logical continuation of the design program."⁴⁰

BILLY WILDER, STUDIO PRO

A midcentury episode in convergence media, the *Discovery* program's basic format was repeated in May of 1956, and the "Chair Story" module repurposed, when Charles Eames was invited to appear on CBS's "prestige" public-affairs program *Omnibus*. Then occupied with second-unit location shooting for his friend Billy Wilder's film *Spirit of St. Louis* (1957), Eames notes his and Ray's admiration for this experimental program:

Perhaps a painless way of doing a program about "myself" would make little reference to *things* we have done but explore a few of a great *variety* of things that will help shape a real human scale environment of the future—this would include many of the things in which we have been interested, from toys and kites to electronic calculators and games of strategy. . . . Inasmuch as this is for a television *workshop* I would not feel right unless we could give special attention to the "production"—some things we would have to shoot, cut, and score here. . . . I doubt we would want to use much of our existing films.⁴¹

Eames insists not on autonomous things but on their sheer variety and networked relations, not on himself as expressive maker but rather on the scenes of happy studio making that augur the productive horizon of the "human scale environment of the future." As its modular schema clarifies, the *Omnibus* program reused some films from the *Discovery* broadcast, including "Chair Story" and "Toys," and presented alternative versions of others, including *House*. The schema also includes films labeled "Kite Film," "Feedback Film," and "ABC." In the first draft of the script, however, the Eameses proposed an alternative final section, which would follow the six-minute "Chair Story" and a station break. Here, "Feedback," a working version of *Introduction to Feedback* (1960), the IBM-commissioned sequel to *A*

Communications Primer, would be “replaced with some film and short (twenty second) pertinent statements by Eero Saarinen, Billy Wilder, and Norbert Wiener.”⁴²

What is an appropriate show-biz segue from the production of plywood chairs to Billy Wilder and cybernetics? The goal of the third part was to model just such connections—to “point out that what was shown in the chair film marked just the beginning of designers’ responsibilities.” That this terrain of expanded production might appear disconnected, or seemingly unrelated to the stuff of furniture, is indicated by notes penciled on the proposed conclusion of the *Omnibus* script: “somehow should end up with a chair if it’s about a chair.”⁴³ Indeed: the chair’s “aboutness” is at stake. Is it an isolated thing or systemically defined? The filmed statements from the unlikely trio of Saarinen, Wiener, and Wilder provide the conceptual logic that would explain to *Omnibus*’s TV audience why the program about a chair is not *just* about a chair—why the designers’ thinking ranges so widely across media and studios and seemingly disparate zones of inquiry, a scalar flexibility provided through the disciplinary solvent of communications theory and the universal aspirations of cybernetics. Saarinen’s oft-cited quip about the designer’s centrifugal expansion of attention to “The Next Larger Thing” (from a chair, to its room, to the building that houses it, to its site, etc.), the script explains, “leads to communication through graphics and through film.” Wiener would offer a caveat about “the danger of abandoning the seemingly unimportant outposts of thinking.” And Wilder, it seems, would explain “the help that comes through communication theory and how this is often at a very human scale.”⁴⁴

By 1957, Wilder had found his way into the thick of the Eameses’ studio practices, and vice versa. We might pause on the strangeness of this fact, born from a lasting and perhaps unlikely friendship hatched in Hollywood of the early postwar, about the time that Wilder’s *Death Mills* and the Eameses’ plywood experiments were discussed in the same 1946 issue of *Arts & Architecture*. We can think of them as discrepant signs of the Janus-faced power of wartime technics and contrary harbingers of the future of “modern man.” While Wilder’s most famous studio productions in Hollywood seemed to be the noir riposte to Eamesian postwar sunshine, Wilder himself functioned as an important model for the Eameses’ studio lifestyle. In a 1950 profile of the Eames house in *Life* magazine, for example, this modeling work was quite literal. Wilder appears in a multiple-exposure photograph, seated in a prototype Eames plywood chair. The previous year, the Eameses had designed a home for the director in the Hollywood Hills. Meant to be a flexible, “unselfconscious” enclosure for a creative artist and his expanding art collection, the home was never built, but the Eameses created a detailed architectural model of the structure at 901 and photographed Wilder and his wife, Audrey, admiring it. The Eames-Wilder friendship fostered a series of exchanges, gifts, favors, and acknowledgments of shared tastes that epitomized the overlapping of 901’s studio lifestyle across various locales. In 1962 Wilder would be quoted in an

admiring profile of the Eameses on this particular aspect of the couple's productive genius: "The usual arbitrary and unfortunate division of life into Home and Office ceases to have any meaning in their case. . . . Their friend Billy Wilder has said, 'They are One.'"⁴⁵

And Wilder himself fostered this "enviable continuity" that became the hallmark of the Eameses' studio lifestyle. Around the time Ray designed the title sequence for Wilder's *Love in the Afternoon* (1957), for example, the director gave the Eameses a toy Ives locomotive that prompted Charles to collect a series of toy trains and thus inspired the production of *Toccata for Toy Trains*, a film shot entirely on an eight-foot tabletop in the Eames house with the help of 901 staff members. And the Eameses would consult with Wilder frequently on their various projects. The Eames archive at the Library of Congress contains a Paramount lot pass for Charles, dated August 14, 1950, as well as a letter from Charles to Billy in March of 1953, as Charles, George Nelson, and Alexander Girard embarked on the Art-X multimedia experiment at the University of Georgia: "We leave today for the GEORGIA panic—and *what* a panic."⁴⁶ Wilder also encouraged the Eameses to visit the Conditorei Kreuzmann pastry and coffee shop in Munich during their 1955 cultural exchange trip with Nelson, Robert Motherwell, and Richard Neutra, and they were so impressed by the shop's nonstop inner workings throughout the night that they produced a three-screen slideshow, *Konditorei* (1955), dedicated to the "ritual forms and organizational harmony of the pastry shop." A few years later, the Eameses called on Wilder's own expertise in the art of democratic propaganda as they, and the USIA's Jack Massey, consulted with him on the design of their five-screen *Glimpses of the U.S.A.* (1959). And the Eameses returned this favor by including in their flowing display of soft power, alongside shots of industrial processes typifying daily life in the US (milling, refining), a clip of a smiling and winking Marilyn Monroe from *Some Like It Hot* (1959).

What Eames seemed to admire about Wilder's studio operations was their own organizational form, as disciplined and logistically orchestrated as a German bakery—or the circus. The montages Eames shot for *The Spirit of St. Louis* are a paean to collaborative productive process on a tight deadline. They occur at a crucial moment in the film, just after Lindberg (James Stewart) meets the engineers who will build the titular plane. In a comic bit Lindberg walks into the unassuming garage and asks for the "executive offices" and to see "the boss." He is directed to a man wearing goggles while cooking fish on an improvised grill heated with a blow-torch, his own kind of Kazam! Machine. Wilder's *mise-en-scène* makes clear that the designers and office personnel capable of delivering the product in a compressed window of time work collectively in an unpretentious shop, much like 901 itself, and the director was likely thinking of Charles Eames's own St. Louis roots and his by-then-famous history of experimental airplane design when he invited him to shoot the montages documenting the team's production of the titular craft.

Eames's montages include various sketches and models of the plane, as the workers in the design office whirl into orchestrated production. Structured by a series of close-ups of objects, tools, machines, and "unselfconscious" materials brought into rhythmic beauty, the montages, unsurprisingly, pay special attention to wood: glued, hammered, curved, sanded, and fashioned into a series of delicate lattices comprising the *Spirit's* wings (fig. 8.5). It is as if Eames scaled the widescreen Warner Bros. star-vehicle down to the kind of modest, honest design process enshrined at 901 and allegorized, on another scale, in *Toccata for Toy Trains*, shot in the Eameses' home studio that same year. *Toccata* opens by explaining why the film features "real" and "old" toys and not scale models. "In a good, old toy," Charles's gentle narration explained, "there is apt to be nothing self-conscious about the use of materials. What is wood is wood. What is tin is tin. What is cast is beautifully cast." That film asks viewers to take pleasure in the sincerity of toys, but of course the Eameses became famous for the bravura of their experimental technical interventions into wood and plastic, for the seeming insincerity of plywood and fiberglass. Like many of the Eameses' films, *Toccata*, like *Spirit*, allegorizes the relentless multimedia productivity of the Eames Office itself, offering "a clue," as Eames's narration says of the old trains, to "what sets the creative climate" of any time.

Wilder's work on *The Spirit of St. Louis* had its own creative lessons to offer; indeed, it would become a model in the Eameses' ongoing parables of production and knowledge work.⁴⁷ While working with Wilder on *Spirit*, Eames produced a slideshow whose narration, addressed to the picture's audience, begins: "It will look easy on the screen, we hope—yet in order to shoot even this simple scene, it took the equipment, and organization of a combination military campaign and traveling circus."⁴⁸ The narration lauds the producer (with "the responsibility of overall planning") and the director (responsible for "the end result of the whole company's activities") of any film as "the two men who drive a picture to a successful conclusion." But the demystifying narration makes clear that their executive "responsibilities" are just part of a teeming network of interlinked "on-the-spot decisions" and "somewhat frantic," cascading responsibilities in the collective endeavor of a studio film like *Spirit*. By the time its far-flung location shooting is finished, "and ready for you to see, more than 20,000 people will have been in some way involved." Eames summons his own montage as an example not just of the decisions and responsibilities sustaining any organization, and, for him, liberal democracy itself, but also such an organization's abiding fuel, communication: "All this activity," he observes, "is directed at THE CAMERA. It is the prima donna of objects and becomes the center of all communication. Through the camera is filtered every form or motion or color you see on the screen—through equipment linked to the camera pass the sounds you will hear." The script frames Wilder not as a romantic auteur but rather as a node in the dispersed sites of a studio production like *Spirit* and thus an Eamesian lesson in efficiently networked communica-

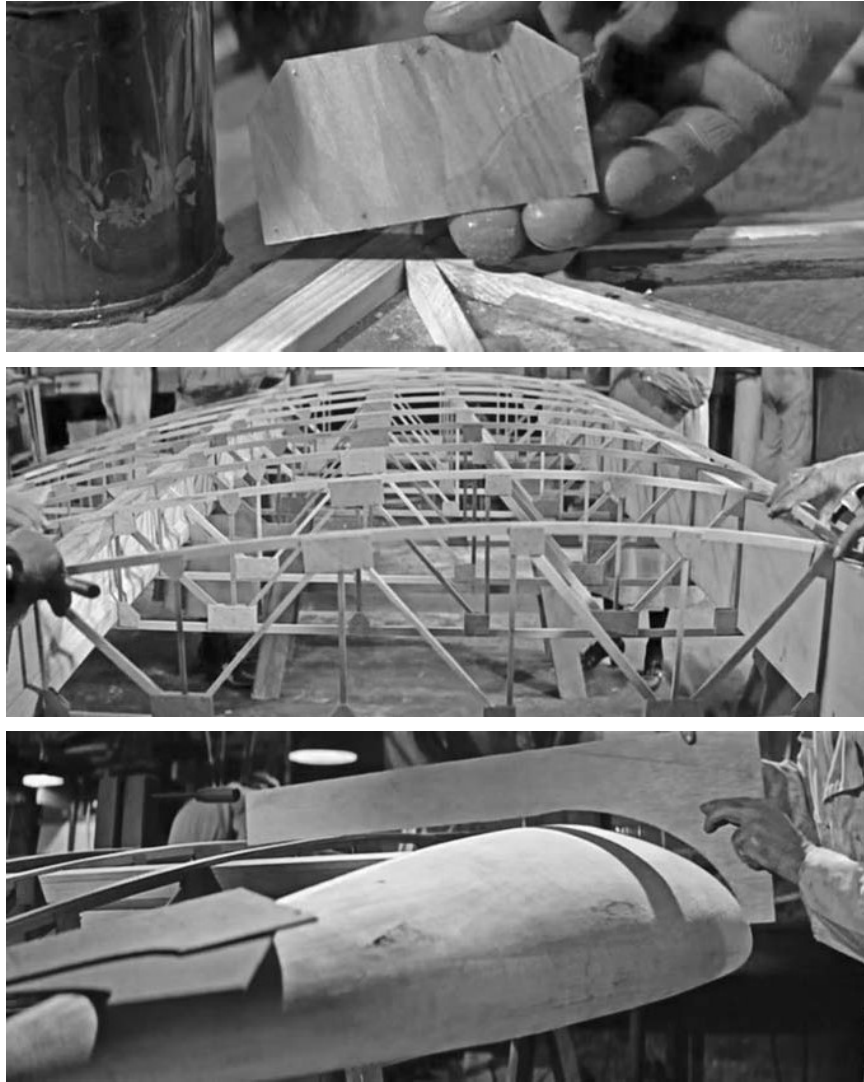


FIGURE 8.5. Unselfconscious materials. Plane design in *The Spirit of St. Louis* (1957).

tion as 901 itself expanded. And it helps us understand why Eames might have asked Wilder to provide a blurb on communications theory for *Omnibus*.

Eames wasn't quite done with Wilder's model. Images of Wilder at work on the set of *Spirit* and other films were later incorporated into the Eameses' three-screen slideshow *Movie Sets* in the last of Charles's six Norton Lectures at Harvard

University in 1970–71. Following Lionel Trilling, Eames's turn as Norton chair was preoccupied with the organizational impulses of liberalism and the problem of happy making, though neither were directly named as such. Rather, their contours were modeled, in content—as lectures *about* models—and in form, as multimedia environments that turned the lecture hall itself into a performance of 901's expanded operations over a more than a quarter century of working. As Franklin F. Ford, dean of the Faculty of Arts and Sciences at Harvard noted in his letter of invitation to Charles, “‘poetry’ is interpreted as all forms of poetic communication,” and the intention of the foundation was to offer the Norton post to “men actively engaged in creation.”⁴⁹ Eames's lectures comprised primarily slideshows and films representing a broad cross-section of the Eameses' work at 901 and their conceptual preoccupations to date. Two key ideas ran as leitmotifs threaded throughout the lectures: the centrality of models and modeling in the Eameses' media practice and the use of visual material, including film, as means of structuring and disseminating information and knowledge.

As the apex of this modeling of modeling, Eames's final Norton lecture clarified, and defended, the organizational tropism of the Eameses' work at 901, and the Eames Era more broadly, even as the studio's operations increasingly dispersed. The problem with administration, his lecture notes indicated, is “centralization” and a centripetal concentration of decision-making power.⁵⁰ This could be combated, the Eameses hoped, by distributing the technical, infrastructural, and institutional resources for informed decision making, and unimpeded transmission of covetable ideas, as democratically as possible.⁵¹ The problem facing society was “not so much a lack of scientific, or technical, or sociological knowledge” but a lack of “ways of transmitting existing knowledge to people as they need it, in forms they can readily grasp and use.”⁵² Similarly, the challenge to liberal-democratic happiness in the late 1960s was not “a lack of values” but rather a vexing excess of conflicting ones. Indeed, Eames continued, “our present discontents . . . show that we do have quite a range of values and that we still feel strongly about them. The difficulty is in accepting that we have no choice but to choose!”⁵³ At the end of the day, then, values had to be chosen, preferences made, distinctions of quality asserted. This, for the Eameses, was the basic ontology of liberal political life and the law of every studio they worked in. It acknowledged the ongoing necessity of life's organization: “If human nature is viewed as changeable, then armies, police, and *administration* will be seen as interim necessities, not immutable requirements.”⁵⁴

The final lecture began with *Movie Sets*, featuring on-location photographs of Billy Wilder in the studio, at work, on various films, including *Spirit*, *Ace in the Hole* (1951), *Sabrina* (1954), *Irma la Douce* (1963), and *Avanti!* (1972) (fig. 8.6). The film studio's technical environment, Eames submitted, was a “model of the environment of the professional process” in a lecture about the role of such models in democratic knowledge work and the capacities of the computer as a tool of mod-



FIGURE 8.6. The camera as the “center of all communication.” Wilder on location in Eames slide show *Movie Sets*. © 2017 Eames Office LLC (eamesoffice.com).

eling and political decision making. Wilder’s studio, in other words, had, like 901, made its final turn toward the condition of postindustrial dispersal. The slideshow was followed by some of the Eameses’ more famous films about the computer: the recent *A Computer Glossary* (1968) and the earlier *Information Machine*. About the latter, then twenty-one years old, Eames felt obliged to note its age, and its “impossibly naive/wide-eyed” attempt to describe the possibilities of a once-alien technology.⁵⁵ A drawing by Ray mapping out the sixth lecture’s themes connected the Eameses’ rhetorical work of modeling, and issues of “machine use,” to the ongoing task of meeting the “universal sense of expectation” ushered in by World War II. That devastating war made people aware of “the promises, and powers, of technology.” And the long postwar boom to follow in the promise of plywood offered “immediate exposure to different ways of living, and a catalog of possessed and possessable objects,” producing the widespread “feeling that he could, even should, have all those things he has seen the others have.” Can the world, Eames asked, still “be arranged so as to fulfill” these “universal expectations”?

The Eameses’ career-long answer to this question was a resounding yes. But not without understanding—as Ray’s diagram put it—that the use of such technology is a “political choice,” one not up to manufacturers but rather redounding to that broader administrative unit of society, as “the real test of Jeffersonian democracy.”⁵⁶ And not without films. Ray’s drawing also included a quotation by Lillian Gish that “films are the mind and heartbeat of this technical century.”⁵⁷ And not, as I’ve argued here, without organizational media like the computer, or plywood, or the efficiency of a node in a professional process named “Billy Wilder” by his intimates. And certainly not without that far-flung studio environment encasing the production of films and toys and exhibits and all of the stuff of Eamesian making called “901.”

NOTES

1. Eames, “Design, Designer, Industry,” 99.
2. Vallye, “Design and the Politics of Knowledge in America, 1937–1967.”
3. Harwood, “R and D: The Eames Office at Work,” in *Explorations in Architecture: Teaching, Design, Research*, ed. Reto Geiser (Basel: Birkhäuser Architecture, 2008), 200.

4. Galison and Jones, "Factory, Laboratory, Studio," 512, 498.
5. See Nieland, *Happiness by Design*. Portions of this chapter appear in a different form in chapter 2 of that book, "Happy Furniture: On the Media Environments of the Eames Chair." My thanks to the University of Minnesota Press for permission to reprint that material here.
6. See Jacobson, *Studios Before the System*.
7. See Riesman, "Leisure and Work in Postindustrial Society"; and Riesman, "Abundance for What?"
8. CAA Publications, *Academy News*, May 1939. Cranbrook Foundation RG 1: Office Records, Box 27, Folder 15, Cranbrook Educational Community.
9. Christensen, *America's Corporate Art*, 109–32.
10. Christensen, 133.
11. See Neuhart and Neuhart, *Story of Eames Furniture, Book 1*, 305–31; "Plywood Flies and Fights," *Fortune*, March 1942, 145–54.
12. "Case Study Houses 8 and 9, by Charles Eames and Eero Saarinen, Architects," *Arts & Architecture*, Dec. 1945, 43–51, 44.
13. "Case Study Houses 8 and 9," 44.
14. Goldstein, introduction to *Arts & Architecture*, 8.
15. See Neuhart and Neuhart, *Story of Eames Furniture, Book 1*, 296.
16. Neuhart and Neuhart, 34.
17. Neuhart and Neuhart, 33.
18. See Frank, "Interdisciplinarity," 91.
19. See Nieland, *Happiness by Design*. See also Cohen-Cole, *The Open Mind*, esp. chap. 3, "Interdisciplinarity as a Virtue." On the Bauhaus's interdisciplinary ambitions see Alexander, "The Core That Wasn't"; and Alexander, *Kinaesthetic Knowing*, 167–201.
20. See Gary, *The Nervous Liberals*.
21. Nelson, "The New Subscape" (1950).
22. *Arts & Architecture*, Sept. 1943, 16.
23. Eliot Noyes, "Charles Eames," *Arts & Architecture*, Sept. 1946, 26.
24. "The Germans See Their Concentration Camps," *Arts & Architecture*, Sept. 1946, 14.
25. Neuhart and Neuhart, *Story of Eames Furniture, Book 1*.
26. Ince, "Something about the World of Charles and Ray Eames," 13.
27. Ince, 13.
28. Neuhart and Neuhart, *Eames Design*, 223.
29. Neuhart and Neuhart clarify that the Eameses increasingly dined, socialized, and hosted at 901—which had a kitchen and full-time cook—rather than at home, despite many famous photos of parties at the Eames House.
30. Neuhart and Neuhart, *Story of Eames Furniture, Book 1*, 29.
31. On the creation of "heuristic environments" in the Eameses' work, especially for IBM, see Harwood, *The Interface*.
32. I borrow the phrase "allegories of production" from David James, *Allegories of Cinema*.
33. Neuhart and Neuhart, *Story of Eames Furniture, Book 1*, 31.
34. Peters, *The Marvelous Clouds*, 37; Klose, *The Container Principle*.
35. Part II: Box 190, Folder: *Discovery* television program (1953). Charles and Ray Eames Papers, Manuscript Division, Library of Congress, Washington, DC. Hereafter EP.
36. II: Box 190, EP.
37. II: Box 190, EP.
38. II: Box 190, EP.
39. II: Box 190, EP.
40. II: Box 190, EP.

41. Excerpted from a handwritten letter from Charles Eames to someone at *Omnibus*; undated, but likely 1956; II: Box 190, EP.
42. II: Box 173, EP.
43. II: Box 173, EP.
44. II: Box 173, EP.
45. II: Box 173, EP.
46. Davenport, "Chairs, Fairs, and Films," 228.
47. II: Box 22, Folder: Wilder, Billy, 1950–57, EP.
48. This new category of labor was coined by Peter Drucker and Fritz Matchlup nearly simultaneously in 1962. See Matchlup, *Production and Distribution of Knowledge in the United States*.
49. II: Box 191, Folder: *Spirit of St. Louis* film montage, EP.
50. II: Box 217, Folder: 1970–1971 Charles Eliot Norton Lectures, Miscellany, EP.
51. II: Box 217, Folder: 1970–1971 Charles Eliot Norton Lectures, Notes, Lecture 6, EP.
52. Schuldenfrei, *Films of Charles and Ray Eames*, 199.
53. Eames, "Smithsonian Lecture Notes," quoted in Schuldenfrei, 202.
54. II: Box 217, Folder: 1970–1971 Charles Eliot Norton Lectures, Notes, Lecture 6, EP.
55. II: Box 217, Folder: 1970–1971, EP.
56. II: Box 217, Folder: 1970–1971, EP.
57. II: Box 217, Folder: 1970–1971, EP.