

Print and Screen, Muriel Cooper at MIT

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## **Abstract**

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Muriel Cooper (1925–94) worked at the Massachusetts Institute of Technology (MIT) for more than four decades as a graphic designer, an educator, and a researcher. Beginning in the early 1950s, she was the first designer in MIT's Office of Publications, where she visualized the latest scientific research in print. In the late 1960s, she became the first Design and Media Director for the MIT Press, rationalizing its publishing protocols and giving form to some of the period's most significant texts in the histories of art, design, and architecture, among other fields. In the mid-1970s, Cooper co-founded the Visible Language Workshop in MIT's Department of Architecture. There she taught experimental printing and explored new imaging technologies in photography and video. And from the 1980s until her death, Cooper was a founding faculty member of the MIT Media Lab, where she turned her attention to the human-computer interface. Cooper helped cultivate a design culture at MIT. And before her premature death, she established some of the metaphors and mentored some of the designers that have shaped our contemporary digital landscape.

Few 20<sup>th</sup> century designers have made significant contributions in both print and digital media, or helped to navigate the epochal transition between the two. Yet Cooper, in designing and redesigning roles for herself within new fields at MIT, did just that. Over her career and across multiple media, Cooper's concerns remained quite consistent: She focused on developing both design tools and user experiences that would provide greater control and quicker feedback, eventually to be aided by machine intelligence. She sought to create experiences that were dynamic rather than static and simultaneous rather than linear, ones that engaged multiple media and a range of human senses. Cooper applied her knowledge of print design to software, and

considered print and the process of its production as a prototype for the experiences that she would seek on screen. She also borrowed freely from media such as photography and film to inspire some of the effects she would later explore in new media. Cooper's career traced an arc, in her practice and her pedagogy, from a focus on objects to one on systems. And her relationship to the digital evolved from a set of effects to be emulated in other media to seeing the computer at first as a tool, then as an assistant, and finally, as the medium itself. At the same time, she participated in a broader shift during this period from the paradigm of the humanist subject to the digitally augmented, "posthuman" condition of the present. In her interests and her achievements, Cooper exceeded any traditional definition of a graphic designer. At the same time, her work has defined the present state of the field. This dissertation, the first dedicated to Cooper, charts her pathbreaking career at MIT while also shedding new light on vital moments in the history of art, design, architecture, and media in postwar America.

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Since this project began, I have had two other institutional homes, both of them exceedingly gracious. Since 2013, I have taught a history course in the MFA program in graphic design at the Yale School of Art. I have learned a great deal from the questions, knowledge, and studio practices of my outstanding students there, as well as from the richness of Yale's museum and library collections. I feel enormously privileged to call program chair Sheila de Bretteville my boss, friend, and inspiration— someone whose energy, enthusiasm, generosity, optimism, and values are galvanizing for me. Besides making great work, and cultivating a remarkable program year after year, Sheila is strong, hopeful, open, and engaged in the world in a remarkable, enviable way.

From 2014–16, I worked at the Harvard Art Museums, as the Stefan Engelhorn Curatorial Fellow. I began just as the museum's tireless staff was moving into a new building, and benefited enormously from the experience, wisdom, and hospitality of those around me. Working in the department of modern and contemporary art, and in particular with the extensive Bauhaus collections, was a thrill, and has refined my sense of the material discussed in this project. I am deeply grateful to my boss, Lynette Roth, an outstanding scholar and curator, who empowered me with her trust and inspired me with her deep commitment to the institution.

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My path to this material has been unexpected. I first discovered Cooper by tracking down the author of iconic modernist works such as the MIT Press logo, or colophon (1963), that still appears on the spine of every Press book, and from engaging classics of art and architectural history such as *The Bauhaus* (1969) and *Learning from Las Vegas* (1972). For me, these were manifestos first for their content and then, also, for their form. Coming to know who was behind these works, and something of her career, was both fascinating and a kind of bait and switch: I thought that I would be encountering a meticulous, modernist master of print, and what I discovered was the rather messy work of a figure whose legacy extended to the digital world. Squaring this circle, and reconciling these two identities, is part of the work of this dissertation. Separately, in 2012, my aunt Deborah Porter married Nicholas Negroponte, Cooper's dear friend and colleague. In spite of his immediate proximity to the subject, I have pursued my work independently and critically, certainly with some suggested sources, but on my own terms.

Reinfurt came to the subject from the opposite end. As a graphic designer working in Silicon Valley in the mid-1990s, he had heard of Cooper's work at the MIT Media Lab, and visited in January of 1995, the year after she died, to learn more. More than a decade later, he was a fellow at MIT's Center for Advanced Visual Studies, where he discovered a trove of prints and posters that he believed to be by Cooper. It turns out they were by her colleague, the more precise designer Jaqueline Casey, but the process of learning this led him on the path that is chronicled in his 2007 essay on Cooper—the main secondary source I could find while

researching her—and to our collaboration. None of these twists and turns was predictable, but I am grateful that they happened as they did.

Most of all, I wish to thank my loving and supportive parents, Trudy and Steven Wiesenberger, to whom this project is dedicated.

## **Dedication**

This project is dedicated to my parents, Trudy and Steven, who taught me how to see.



## Introduction

In a 1986 video titled “Research Topics at the Visible Language Workshop,” Muriel Cooper explains the sponsored research that she and her students are conducting at MIT on the human-computer interface. She sits at a cluttered desk surrounded by graduate students at graphics workstations. Her hair is short and gray, and she wears a matching polka dot blouse and shirt, reading glasses, and a calculator watch. She speaks animatedly about “the hideous wilderness of alphanumeric data” confronted by computer users, and her group’s work to combat it.<sup>1</sup> The camera cuts to students demonstrating their projects on artificially intelligent design tools, in a video intended to show sponsors like IBM how their research dollars were being spent. A narrator states that “The next decade will find the [Visible Language Workshop] group exploring new verbal and visual languages, in an expanded computer environment— an environment in which instructions may become conversations, and tools become intelligent assistants.” Cooper muses on this near future, one we are currently navigating. She speaks of the computer as personal and personalizable, graphically rich and expressive, multi-functional and multimedia, intelligent and ever-present, observing:

If you look at the computer as an environment in which you do multiple tasks, and which is ubiquitous in your life, then it’s even more important that this personalization and configurability take place... because today I may want to work on music and then go to my cookbook. And then read my newspaper. Or design my newspaper!

She smiles at the possibility, and the picture fades.

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<sup>1</sup> Visible Language Workshop, MIT Media Lab, “Research Topics at the Visible Language Workshop,” 1986, running time 13:48, Visible Language Workshop Archive, MIT Program in Art, Culture, and Technology.

## **Print and Screen**

Muriel Cooper (1925–94) worked at the Massachusetts Institute of Technology for more than four decades as a graphic designer, an educator, and a researcher. Beginning in the early 1950s, she was the first designer in MIT’s Office of Publications, where she visualized the latest scientific research in print. In the late 1960s, she became the first Design and Media Director for the MIT Press, rationalizing its publishing protocols and giving form to some of the period’s most significant texts in the histories of art, design, and architecture, among other fields. In the mid-1970s, Cooper co-founded the Visible Language Workshop in MIT’s Department of Architecture. There she taught experimental printing and explored new imaging technologies in photography and video. And from the 1980s until her death, Cooper was a founding faculty member of the MIT Media Lab, where she turned her attention to the human-computer interface. Cooper helped cultivate a design culture at MIT. And before her premature death, she established some of the metaphors and mentored some of the designers that have shaped our contemporary digital landscape.

Few 20<sup>th</sup> century designers have made significant contributions in both print and digital media, or helped to navigate the epochal transition between the two. Yet Cooper, in designing and redesigning roles for herself within new fields at MIT, did just that. Over her career and across multiple media, Cooper’s concerns remained quite consistent: She focused on developing both design tools and user experiences that would provide greater control and quicker feedback, eventually to be aided by machine intelligence. She sought to create experiences that were dynamic rather than static and simultaneous rather than linear, ones that engaged multiple media and a range of human senses. Cooper applied her knowledge of print design to software, and considered print and the process of its production as a prototype for the experiences that she

would seek on screen. She also borrowed freely from media such as photography and film to inspire some of the effects she would later explore in new media. Cooper's career traced an arc, in her practice and her pedagogy, from a focus on objects to one on systems. And her relationship to the digital evolved from a set of effects to be emulated in other media to seeing the computer at first as a tool, then as an assistant, and finally, as the medium itself. At the same time, she participated in a broader shift during this period from the paradigm of the humanist subject to the digitally augmented, "posthuman" condition of the present. In her interests and her achievements, Cooper exceeded any traditional definition of a graphic designer. At the same time, her work has defined the present state of the field.

This dissertation charts Cooper's work over four chapters that correspond to the four institutional settings in which she worked at MIT. In this sense it is a biographically driven institutional history, one that sheds light on seminal moments in the history of art, design, and architecture—and MIT in the postwar period—by focusing on Cooper and the organizations she shaped, worked within, and was frequently in tension with. The first chapter considers Cooper's role as a designer in MIT's Office of Publications, and some of her freelance work afterward, from the mid-1950s to mid-1960s, in the context of American graphic design in the immediate postwar period. The second covers Cooper's tenure at the MIT Press, from the late-1960s until the late-1970s, in terms of two major projects in particular (*The Bauhaus* and *Learning from Las Vegas*), her broader work to design a publishing program, and her research into new print technologies. The third chapter examines Cooper's teaching in the Visible Language Workshop—which she co-directed with Ron MacNeil in the Department of Architecture, and which existed in that form from the mid-1970s through the mid-1980s—as well as complementary activities in art and architecture at MIT. The final chapter takes up the context of

computing, and Cooper's work at the MIT Media Lab, where she supervised graduate students doing sponsored research on the human-computer interface, from the mid-1980s until her death. These institutional affiliations overlapped to some degree, as did Cooper's activities of design, teaching, and research, but the four-part structure is motivated by her own, self-conscious reorientation at different stages in her career.

The title of this dissertation, "Print and Screen, Muriel Cooper at MIT," verges on bland description in order to present a proposition. Rather than establishing Cooper's significance in disciplinary terms—of art, design, or architecture—it speaks to the media settings in which she worked. "Print" allows for product and process, noun and verb, encompassing the act of making and the myriad results, whether one-off posters or mass-produced publications. "Screen" casts the net wide to include all that appears on a range of electronic displays as an interface for computation, while also evoking the experience of cinema, from which Cooper took many cues. At the same time, this project is not a genealogy or media theorization of either print culture or the screen as such, although it corresponds to a period and place of great innovation in computer graphics.<sup>2</sup> Rather, it adopts the still-common language of graphic designers to refer to the two primary environments in which their work might appear. For Cooper, whose engagement was primarily non-technical, her work in spanning these environments remains one of the most salient aspects of her career. The conjunction "and" in the title might also be emphasized: naming these two media does not foreground a progression "from" one and "to" the other, a teleological march toward new media. Rather, Cooper appreciated the specificity of both print *and* digital media, and how they could mutually inform one another. Finally, specifying "at

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<sup>2</sup> For a recent and excellent genealogy of computer graphics, see Jacob Gaboury, "The Random-Access Image: Memory and the History of the Computer Screen," *Grey Room* 70 (Winter 2018), 24–53. As Gaboury writes, "The computer screen is a relatively recent invention and is by no means essential to the concept of computation itself."

MIT” acknowledges that Cooper spent almost her entire professional life at the institution, and that her work depended to an enormous degree on its people and resources.

Indeed, Cooper’s work is inconceivable without the context of MIT. Her colleagues, collaborators, and students were indispensable in helping to establish some of the formal and intellectual priorities for her work, just as her collaborators and students made much of the work technologically possible. In her design practice, Cooper absorbed a great deal in terms of aesthetics and technique from her talented colleagues. Likewise, several of the perceptual leitmotifs in her work had trajectories in visual studies, architecture, and urban planning at MIT that predated her, such as the spatialization of information and the metaphor of driving—or flying—through it. In her teaching and research, Cooper extended an interest in systems thinking, artificial intelligence, and the user interface motivated by many of her peers, especially in MIT’s Architecture Machine Group and at the MIT Media Lab. Finally, Cooper benefited greatly from the sponsored research environment of MIT, which depended on both corporate and defense support, and introduced its own set of ethical dilemmas.

### **Locating Cooper**

Muriel Cooper’s work has long been underrecognized, likely for a host of reasons. To name a few: She worked mostly behind the scenes, and on collaborative teams, and the work—generally not public, and often difficult to understand—may not have survived in its original form, in fragile media such as film or software. Design history is also relatively less established than the histories of art and architecture, and Cooper’s work anyway exceeds traditional conceptions of graphic design, and merges with these other fields. The history is also recent, and some of its technical aspects have been so quickly naturalized in our daily lives as to seem ordinary or even

banal. Cooper also died suddenly, at the threshold of important research; she was unable to consolidate her work or legacy at the end of her life, and perhaps, as a matter of disposition, not interested in doing so during it. Finally, she was a she—a fact which generally predisposes artists' work to be taken less seriously than their male peers, especially during the period in question, and in the design and technological milieu generally. Likewise, much of her work can be seen as administrative, affective, or reproductive, and overlooked as such, compared to the patriarchal values of authorship, authority, and virtuosity attributed to great designers.

The state of archival holdings has also hampered appreciation of Cooper's work. This affects our understanding of her as a designer, especially from the standpoint of process. There is no archive, for example, for MIT's Office of Publications, and the quite extensive MIT Press Archive was lost in a flood several years before this research project began. Still, the products of Cooper's publication design are, as mass media, ubiquitous and available for study. Likewise, other printed work by Cooper and her collaborators, and a great deal of documentary material, survives. The major repository for work and documentation from Cooper's early career, mostly pre-1980s, is the Muriel R. Cooper Collection, held by the Morton R. Godine Library at the Massachusetts College of Art and Design, Cooper's alma mater. While the collection is unprocessed and uneven in quality, it is extensive, and recent attention to Cooper has revived interest in its maintenance. The other major archival collection, primarily documentary material from Cooper's later career, is held by MIT's Institute Archives. It is extensive but also unprocessed, and was only unsealed during this research. Some work by Cooper, but mostly that of her students, is held by the MIT Museum, and the Center for Advanced Visual Studies Special Collection also holds some materials related to the Visible Language Workshop. Information about all of these objects, such as dating, medium, and authorship—which was itself

deemphasized in a collaborative and non-artistic setting—is rarely provided by the collecting institutions, and was instead part of my research process, with all of the pitfalls this implies for giving some authors and makers greater visibility while failing to recognize others. Finally, I made use of the private collections of some of Cooper’s collaborators, students, and family, whom I interviewed extensively. The little writing Cooper published has proved essential, as have her recorded or transcribed talks and interviews with her.

Secondary literature on Cooper has been limited. There was some design and technology writing published during her later years, and some commemoration of her death. Among historians, a few anthologies of graphic designers, especially women designers, have included her. Art and architectural historians have addressed Cooper mainly in the context of her design of the 1972 first edition of *Learning from Las Vegas*. David Reinfurt published an essay on Cooper in 2007. He and I then staged a 2014 exhibition at the Arthur Ross Architecture Gallery at Columbia University, and produced a small gallery booklet with extended captions on the work. Cooper received some more attention following the exhibition, which coincided with the 20<sup>th</sup> anniversary of her death. I also published an essay on Cooper’s design and multimedia restagings of Hans Wingler’s 1969 book *The Bauhaus* in 2016. Later that year, the Museum of Modern Art acquired its first work by Cooper, the 1994 interface demonstration “Information Landscapes.” Reinfurt and I co-authored a monograph, *Muriel Cooper*, with the MIT Press that appeared in Fall 2017. This was followed by a symposium at MIT on October 19, 2017, honoring the 50<sup>th</sup> anniversary of Cooper joining the staff of the MIT Press.

This project is distinct from those earlier ones in important ways. It is at once more granular in detail, contextual in scope, and critical in treatment than the others; it goes both deeper and wider. The book was comprised of two short essays by Reinfurt and me, overviews of

Cooper's early and late work, in print and software, respectively. It was devoted mainly to full-color reproductions of her work, most of which had not been seen before. The book was in some ways more akin to a belated catalog for the exhibition, and an introductory text on Cooper, than an academic monograph. The publication, like the exhibition that inspired it, was primarily object-focused, giving special weight to what could be shown or illustrated. This dissertation, by contrast, attempts to reconstruct more of the connective tissue that undergirded the production of these objects. It places Cooper within the larger context of postwar art, design, and media.

Each of these formats also has its own specificity. The exhibition, for example, was an early attempt to surface the material publically, and for exhibition-making to function as a kind of research. Likewise, in conjunction with the exhibition design and production team, Reinfurt and I hoped to stage the objects in space in a fashion appropriate to the subject, namely at the intersection of still and moving images, and two- and three-dimensional space, real and simulated. (This attempt to harmonize form and content contrasts with the present, conspicuously un-designed text, which is clearly not the ideal venue in which to perform Cooper's approach to information design.) Each of these forms, of course, are less fluid and forgiving, of errors or outside input, than the electronic ones Cooper considered late in her career.

We chose to begin the book with an epigraph from Cooper: "I guess I'm never sure that print is truly linear."<sup>3</sup> Uttered well into her work in software in the 1990s, it is, quite typically for her, a statement of ambivalence, but also possibility. After just having explained the unique attributes of print versus digital media, Cooper backtracked, acknowledging print as its own specific technology. Starting the publication in this way was both an invitation to readers on how

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<sup>3</sup> Quoted in Janet Abrams, "Muriel Cooper's Visible Wisdom," *I.D. Magazine*, October 1994. Cooper's thinking about the linearity of print culture was influenced by Marshall McLuhan, *The Gutenberg Galaxy: The Making of Typographic Man* (Toronto: University of Toronto Press, 1962).



it could be used, and also a self-reflexive gesture, given the medium, that sought to channel some of Cooper's cheekiness.

In each of these projects, the present one included, the disciplinary coordinates of the research remain complex and even unresolved. On the one hand, this is an art history of often unaesthetic work: Many of the objects discussed here are process-oriented and aesthetically uninteresting at best, an eyesore at worst (the so-called "Bad Mona" computer renderings made by Cooper's students in the 1980s, for example, which gave Leonardo's sitter a cigarette and motorcycle jacket, are clearly more significant in terms of process than form). On the other hand, this is in part a media history focused on a technical novice: For a computer graphics "pioneer," Cooper was notoriously unable to code and uneasy about discussions of technological implementation. The aim of this project is to ascertain how it was that Cooper produced the work she did, directly and indirectly, and what was distinctive both about her approach and her institutional context—indeed, how and why her work was mostly undertaken in a department of architecture, specifically, and at MIT generally. Likewise, this project traces a genealogy for much of our digital environment, including the way we think about reading on screens, user interfaces, information visualization, and consumer software tools for word processing and design. The language and narrative of "invention" or "discovery" bandied about in our innovation-obsessed culture is of relatively less interest here. Cooper invented little, in part or whole, yet she did recognize and explore technological possibilities in a way that is consistent, distinctive, and historically consequential.

## “General Design”

This project is not properly a biography, in the sense of accounting for Cooper’s personal life, but some biographical preliminaries are in order. Muriel Ruth Cooper was born December 10, 1925, in the Boston suburb of Brookline, the eldest daughter of three. As her youngest sister Charlotte recalled, there was always the expectation in the household that each of the women would go on to college and a career, rather than being dependent on a spouse.<sup>4</sup> Cooper, who had made artwork from an early age, never took seriously the possibility of becoming an artist. But being a teacher, as both her sisters would also decide to do, seemed more acceptable.

Eclecticism, independence, and energy were abundant in her life, even from an early age: she was a collector, a hoarder, and a flamboyant dresser; she took on various projects serially and with gusto; and she worked more or less constantly.

Cooper studied briefly at the Ohio State University before transferring to the Massachusetts School of Art (today’s Massachusetts College of Art and Design), where she graduated in 1948.<sup>5</sup> She appears to have been a middling student. Cooper’s strength and passion was in drawing, and her earliest design work, such as the 1948 Annual for the Massachusetts School of Art (fig. 1.1), is playful and illustrative, consistent with a decorative and biomorphic style then current in America.<sup>6</sup> Cooper did not learn the rudiments of typographic design in school. Rather, as her later colleague at MIT Dietmar Winkler noted, “She learned design on the

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<sup>4</sup> Charlotte Lopoten, interview by author, telephone, January 24, 2015.

<sup>5</sup> Cooper’s parents pulled her from Ohio State University after a dispiriting visit there, apparently because it seemed more conducive to partying than studying. Jonathan Jackson, interview by author, telephone, February 2, 2015.

<sup>6</sup> This broad stylistic umbrella, for the so-called “Atomic Age,” has been referred to as “vital forms.” See Brooklyn Museum, *Vital Forms: American Art and Design in the Atomic Age, 1940–1960*, ed. Brooke Kamin Rapaport (New York: Harry N. Abrams, 2001).

hoof.”<sup>7</sup> While her degree in “General Design” did not train Cooper in typography, it is also the case that graphic design as a profession had not yet gained a foothold in American education, as it would in the course of the 1950s and 60s, when it emerged in distinction to advertising and “commercial art.” As Rob Roy Kelly has written, students in graphic design at Yale University, the first American school to offer a degree program in the subject in 1950, viewed the practice as “being focused on problem solving and communication, and something quite separate from advertising.”<sup>8</sup> Likewise, American curricula had generally only absorbed the modernist typography of European emigres after Cooper graduated.<sup>9</sup> Following college, Cooper worked for a year in New York ad agencies, which she disliked for the interactions with and demands from clients, before returning to the Massachusetts School of Art to earn a teaching degree, which she completed in 1951. That year she worked as a designer at Boston’s Institute of Contemporary Art and taught design the following year at the University of Maryland. Though she would cycle through roles at her next employer, MIT, she would spend the rest of her career working there.

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<sup>7</sup> Dietmar Winkler, email to author, November 27, 2017.

<sup>8</sup> Rob Roy Kelly, “The Early Years of Graphic Design at Yale University,” *Design Issues* 17, no. 3 (July 1, 2001), 14. This program was headed by former Bauhaus master and Black Mountain College instructor Josef Albers.

<sup>9</sup> Armin Hofmann, for example, the major Swiss designer and educator, first taught in the United States in 1955, at the Philadelphia College of Art, shortly before he began teaching at Yale University. See Rick Poynor, “Armin Hofmann: 2011 AIGA Medal,” *AIGA*, March 1, 2011, <https://www.aiga.org/medalist-arminhofmann>.

## Chapter 1. Office of Publications Developing a Visual Language

### Design as a Service

The early years of the Cold War represented a boom period for the Massachusetts Institute of Technology. Flush with sponsored research funds from government agencies, MIT was one of the foremost exemplars of the so-called military-industrial-academic complex among American universities.<sup>1</sup> This research funding had begun at the outbreak of hostilities in World War II, and ramped up considerably during the Cold War. In 1957, federal funds comprised 89% of MIT's research support; following the launch of Sputnik that year, funding soared, crossing the \$1 billion threshold by the late 1960s.<sup>2</sup>

In 1951, John Mattill, an administrator in MIT's News Office, established the Office of Publications to centralize and manage the growing quantity of communications across the Institute. The Office was to provide writing and editing services, in addition to giving these materials form. Mattill's sensitivity to the importance of design came, he explained, from a summer course he had taken at the University of Iowa, where he was inspired by the typographic quality of the university's Prairie Press imprint.<sup>3</sup> In past, when a Dean or other MIT

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<sup>1</sup> See Stuart W. Leslie, *The Cold War and American Science: The Military-Industrial-Academic Complex at MIT and Stanford* (New York: Columbia University Press, 1993).

<sup>2</sup> Claude Canizares, "Sixty-Six Years of Sponsored Research," *MIT Faculty Newsletter*, January 2007, <http://web.mit.edu/fnl/volume/193/canizares.html>. See also included graph, "MIT Numbers: MIT Research Expenditures (FY1940–2006)."

<sup>3</sup> John Mattill, interview by author, telephone, March 16, 2015. Carroll Coleman, a typographer and printer, established the Prairie Press in Iowa in the mid-1930s. He became a designer for, and eventually an editor and the director of, the University of Iowa's publications program. He remained active in publishing through the 1960s. See John Harrison, "A Confirmed Typomaniac: Carroll Coleman and the Prairie Press," *Books at Iowa* 62 (April 1995).

administrator had needed a flier or notice, he or she would go directly to the printer, resulting in diverse and often visually uninspiring results.

Mattill did not know whom to hire as a designer, but asked his colleague Gyorgy Kepes, who had been teaching visual design in the Department of Architecture since 1945, for a recommendation. Kepes suggested Cooper. It is likely that the two met in Boston's design circles, but they would have interacted, at the latest, when Cooper was working at Boston's Institute for Contemporary Art in 1951, while Kepes was designing the exhibition and publicity for the 1952 retrospective of his friend, Walter Gropius.<sup>4</sup> On Kepes's recommendation, Cooper became the Office's first in-house designer. She liked to claim, though it is difficult to verify, that the Institute's Office of Publications was the nation's first dedicated, in-house design office at a university. Mattill, more cautiously, agrees that it was in any case one of the very first.<sup>5</sup>

In her time at the Office, Cooper designed prospectuses, fliers, and even record album sleeves for MIT courses and events (fig. 1.2). Perhaps her largest output was of fliers for the Institute's summer session courses (fig. 1.3), generally between one and three weeks long and taught by Institute faculty.<sup>6</sup> About 30 such courses in technical subjects were offered each summer to scientists, engineers, and industry specialists. For each summer course, Cooper created a unique flier. Courses in 1954, the first year for which she would design pamphlets, carried names such as "High Temperature Ceramics," "Transistors and their Applications," "Soil Technology," "City and Regional Planning," "Transonic Aerodynamics," "Control Problems of

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<sup>4</sup> "Gropius Exhibition," *Institute of Contemporary Art Bulletin* 1, no. 1 (February 1952).

<sup>5</sup> Mattill, interview.

<sup>6</sup> While MIT had a long history of offering summer programming of various kinds, a dedicated office for the Summer Session was established in 1949. Ernest H. Huntress, "The M.I.T. Summer Session," *The Technology Review*, 56, no. 4, February 1954.

the Executive,” and “Digital Computers: Advanced Coding Techniques.” Cooper’s bi-fold fliers, roughly eight inches square, tended to feature bold, colorful graphics on the cover that used either illustration, photography, or photomontage; a title, often in sans serif type, some of it rather eccentrically spaced to suggest physical effects, such as movement or vibration; and conservative, serified body copy inside, describing the course. To create these fliers, Cooper consulted the instructors to understand the material better, and to find artwork she might use in her design. She later explained her intentions for the work as follows:

I have been particularly concerned with the urgent need to make more intelligible the highly complex language of science, and have attempted to articulate in symbolic, graphic form the order and beauty inherent in the scientist’s abstract vision. The growth and success of this program has demonstrated that a responsible design approach can interpret between scientist and layman; influence the aesthetic values of people within such an institution; convey the character of such a large, specialized institution to the public; and can encourage the development of similar design programs in other institutions.<sup>7</sup>

In this sentiment, and in the work, whether consciously or not, Cooper was in many ways realizing priorities articulated by Kepes. Indeed, her work in the Office of Publications, and on these announcements in particular, appears as an exemplary case of Kepes’s thinking about the potential of graphic design as part of a feedback loop of communication, education, and inspiration between artists, scientists, and the public. While it appears that Cooper collaborated on a few projects with Kepes on a freelance basis, it would be an exaggeration to suggest that he was her mentor, or that the two were even especially close. Tempting as such a claim would be, the record does not support it, neither with archival correspondence nor with published references of one to the other. Nevertheless, Kepes’s ideas deserve attention in order to understand Cooper’s formation.

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<sup>7</sup> Muriel Cooper, draft application materials for Fulbright Fellowship, c. 1957, n.p. Muriel R. Cooper Collection, Morton R. Godine Library, Archive, Massachusetts College of Art and Design, 12-393.

## Kepes and Cooper

In 1945, Kepes came to MIT to teach visual design in the Department of Architecture. Kepes's avant-garde pedigree was extensive, and no doubt of great interest for Cooper. He had collaborated with Bauhaus master Lászlò Moholy-Nagy, his compatriot and eleven years his senior, in Berlin, London, and then Chicago, where Moholy-Nagy asked him to found a department of light and color at the New Bauhaus, which he directed. Kepes's first major book, *The Language of Vision*, of 1944, was a major influence on Cooper, as it was for many students of art and design. *The Language of Vision* began with a simple observation: "Today we experience chaos."<sup>8</sup> By this Kepes meant chaos in both the cacophony of the physical world, and by extension, in the psyche of man. He worried about overspecialization atomizing society, about a lack of shared values, and, along with other of his contemporaries, about a growing gulf between "thinking" and "feeling."<sup>9</sup> The problem corresponded to a rift between the arts and sciences, or what C.P. Snow would memorably call "the two cultures," which were no longer able to communicate meaningfully or learn from one another.<sup>10</sup> This concerns fueled Kepes's efforts to foster collaboration between artists and scientists, which he made the focus of his long career at MIT.

The *Language of Vision* attempted to chronicle and consolidate a new "modern tradition." Kepes presented the characteristics of this new language of vision in three chapters, adducing ancient and avant-garde art, advertising, and diagrams of design assignments as

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<sup>8</sup> Gyorgy Kepes, *Language of Vision* (Chicago: Paul Theobald, 1944), 13.

<sup>9</sup> The idea of a breakdown between thinking and feeling was part of a larger discourse during this period; see, for example, Sigfried Giedion, *Space, Time and Architecture; the Growth of a New Tradition* (Cambridge, MA: Harvard University Press, 1941).

<sup>10</sup> C.P. Snow, *The Two Cultures and the Scientific Revolution* (New York: Cambridge University Press, 1959).

evidence. The layout of the book itself, freely interspersing text and image in dynamic, asymmetric layouts, was an important aspect of its message, and part of its considerable influence at the time of its publication. The first two chapters, titled “Plastic organization” and “Visual representation,” catalog the different components of perceiving and image-making, from a formal, technical, and psychological standpoint. Kepes discusses visual qualities such as “transparency,” “interpenetration,” “multiple, simultaneous perspective,” the “influence of artificial light-sources,” and “representation of movement using painting, photography, and advertising.”<sup>11</sup> The final section, “Toward a Dynamic Iconography,” ends by giving special weight to “the practical tasks of contemporary advertising art.” The latter field, Kepes believed, was powerful for being a contemporary art form and not beholden to tradition; for being ubiquitous and in the public’s eye; and for having the capacity to sharpen viewers’ visual acuity and “disseminate socially useful messages.” Advertising art, he argued “could contribute effectively in preparing the way for a positive popular art, an art reaching everybody and understood by everyone.”<sup>12</sup> Kepes illustrates this section with the recent work of leading graphic designers, including the Bauhaus emigre Herbert Bayer, Alexei Brodovitch, Will Burtin, Paul Rand, and himself, and along with slightly older work by El Lissitzky and A.M. Cassandre. The book’s subtitle (on the dustjacket of many editions, if not on the cover or title page) is: “Painting, Photography, Advertising Design.” This supplants the third term in a succession of media from the title of Moholy-Nagy’s seminal book *Painting, Photography, Film* (1925/7), originally

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<sup>11</sup> Kepes, 77 and 90.

<sup>12</sup> Kepes, 221.



published in the “Bauhaus Books” series, and almost as influential for its graphic design, by the author, as its argument.<sup>13</sup>

In ways that would prove directly relevant to Cooper’s practice, and graphic design’s relationship to other media, Kepes addressed himself specifically to publication design five years later, in his contribution to a conference and the resulting book, which he edited, titled *Graphic Forms: The Arts as Related to the Book*. The meetings were held at Harvard’s Fogg Museum, and the book collecting the papers presented was published by the Harvard University Press. In his paper, “Function in Modern Design,” Kepes began by observing that publishing, not much advanced since Gutenberg, needed to catch up with the rapid pace of contemporary technology. He likewise argued for facilitating the reader’s non-linear movement within the book, and for flexibility in the layout. He suggested both that the printed book must find its own specificity as a medium, and also that it might learn from newer, time-based media:

It seems to be essential to understand what form of communication can best fulfill certain aspects of messages. Motion-picture photography and television become major factors in our life.... Only recently serious concerns were voiced by leaders of the book industry about the dangerous impact of television on the book industry. Creative thinkers are needed who could guide the proper problems to the proper agents and develop the appropriate distribution of function among the new and old forms of visual communication. There is also chance [sic] for a cross-fertilization of ideas, techniques, idioms. It is very possible that book design will benefit greatly from the montage technique of motion pictures as well as from the idioms of television.<sup>14</sup>

Invoking the “language of vision” described in his book, Kepes called for these new visual techniques to be reflected in print:

We are moving toward broader idioms of simultaneity, of transparency, of interpenetration. These are displacing linear perspective in thinking and seeing. Contemporary painting, architecture, design, writing, and physical science are developing powerful new methods

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<sup>13</sup> László Moholy-Nagy, *Malerei, Fotografie, Film* (Munich: Albert Langen Verlag, 1927). Just as Moholy’s interest in film remained, at that point, aspirational, film likewise did not play a major role in Kepes’s book of some two decades later, despite great advances in the medium.

<sup>14</sup> Gyorgy Kepes, “Function in Modern Design,” in *Graphic Forms: The Arts as Related to the Book* (Cambridge, MA: Harvard University Press, 1949), 11.

to reach this new operational area. Transparency in painting, [and] interpenetration of internal and external space in buildings, point toward an even more dynamic visual language of simultaneity. Printed communication has its own contribution to make to this new language, its new place to take in the world of vision.<sup>15</sup>

Kepes's next major book, *The New Landscape in Art and Science*, was published in 1956 by Paul Theobald Press in Chicago (and written, according to the author, from 1947–52, with the expectation that it would be published by MIT's "Technology Press" imprint). The book, as explained in the preface by MIT's Dean of Humanities and Social Studies, John E. Burchard, took part in "the search for the unity of science and the humanities" at MIT generally and in Kepes's work there specifically.<sup>16</sup> In Kepes's own preface he explained that the book was "meant to be looked at more than read"; it was, in other words, "a picture book."<sup>17</sup>

Healing the divide wrought by overspecialization would require regaining contact with our senses, Kepes argued, and reorganizing our sense of vision. Makers of visual form, whether art or design, could play a special role in this. Kepes observed:

The essential vision of reality presents us not with fugitive appearances but with felt patterns of order which have coherence and meaning for the eye and for the mind. Symmetry, balance and rhythmic sequence express essential characteristics of natural phenomena: the connectedness of nature—the order, the logic, the living process. Here art and science can meet on common ground.<sup>18</sup>

Consequently, Kepes argued, "Artistic expressions which convey a sense of relatedness can provide science with new resources for visualization."<sup>19</sup> This thinking was reflected in the enormous quantity of technical images Kepes included in the book, through microscopes and

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<sup>15</sup> Ibid.

<sup>16</sup> Gyorgy Kepes, *The New Landscape in Art and Science* (Chicago: Paul Theobald, 1956), 9.

<sup>17</sup> Ibid., 17.

<sup>18</sup> Ibid., 24.

<sup>19</sup> Ibid., 26.

through telescopes, and from the research labs of MIT, Harvard, and beyond. As Reinhold Martin argues, Kepes thought in terms of a cybernetic feedback loop, inspired by the seminal research of his colleague Norbert Wiener,<sup>20</sup> by which the artist could train the scientist, and wider society, by processing and analyzing these technical images. “Thus,” Martin writes, in explaining the transition from Kepes’s first book to his second, “had the ‘new vision’ opened onto a ‘new landscape’ of images coming out of the research laboratories of the military-industrial complex, where the alienation of the scientific specialist was overcome by the retrained eye of the artist.”<sup>21</sup>

Kepes’s book developed a concept first presented in his 1951 exhibition in MIT’s Hayden Gallery, *The New Landscape*. In the same year that MIT’s Office of Publications opened, Kepes exhibited photos from his own collection on floor-to-ceiling posts to create a floating field of patterns in the gallery. In fact, some of the images, or ones like them, appeared as elements of the cover art in Cooper’s summer session brochures (fig. 1.4). The 1956 book, by including “art” in the subtitle, showed these patterns as operating in artworks as well. Between the two major book projects, Orit Halpern has argued, also came a new mode of computational thinking for Kepes that paralleled one soon to be experienced by Cooper. Halpern writes that “the terms ‘language’ and ‘vision’ mutated into ‘environment’ and ‘process’ by way of a new form of computational sense. This scene marks a critical moment in the histories of visibility when perception gained autonomy as a material process and the image was no longer understood as representational (a language) but rather as a landscape or environment.”<sup>22</sup> By mining technical

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<sup>20</sup> Norbert Wiener, *Cybernetics; Or, Control and Communication in the Animal and the Machine* (Cambridge, MA: MIT Press, 1961).

<sup>21</sup> Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge, MA: MIT Press, 2003), 67.

<sup>22</sup> Orit Halpern, “Perceptual Machines: Communication, Archiving, and Vision in Post-War American Design,” *Journal of Visual Culture* 11, no. 3 (December 1, 2012): 328–51.

and scientific images for their formal aspects and abstract patterns to translate into her work, and to re-present to the scientific community, Cooper was a relay in the feedback loop Kepes envisioned.

### **Milan and Design Services**

As the workload of the Office of Publication's grew, Cooper soon expanded her design team. In 1955, she hired her former classmate and friend, Jacqueline Casey.<sup>23</sup> Casey had graduated from the Massachusetts College of Art in 1949 with a bachelor of fine arts degree in fashion design and illustration. As Cooper recalls, she and Casey were cashiers at the school bookstore, which they used as a studio together after hours.<sup>24</sup> Casey worked in fashion illustration, advertising, and interior decorating after college. She would go on to lead the Office of Publications, to be reorganized and renamed "Design Services" under her tenure, until her retirement in 1989.<sup>25</sup> Casey came to exemplify what would become known as the "MIT style,"<sup>26</sup> a reference to so-called Swiss- or International-style graphic design practices, typified by the use of sans serif

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<sup>23</sup> For more on Casey, see Steven Heller and Greg D'Onofrio, *The Moderns: Midcentury American Graphic Design* (New York: Abrams, 2017), 140. Dietmar R. Winkler, ed., *Posters: Jacqueline S. Casey: Thirty Years of Design at MIT* (Cambridge, MA: MIT Museum, 1992). Ellen Lupton, ed., *MIT/CASEY* (New York: Herb Lubalin Study Center of Design and Typography, 1989).

<sup>24</sup> Muriel Cooper, unpublished interview by Ellen Lupton, May 7, 1994, <http://elupton.com/2010/07/cooper-muriel/>.

<sup>25</sup> The centralization of the Office of Publications would eventually yield to greater independence for administrative departments, according to Dietmar Winkler, based on a number of factors: Diminishing federal support for research after the Vietnam War meant fewer publications were funded by the central administration; the office was no longer able to provide writing and editing as a service; and Casey and Coburn both reduced their working hours. The Office of Publications thus reorganized, with a smaller remit, as Design Services. Dietmar Winkler, email to author, December 21, 2017.

<sup>26</sup> The designation of an "MIT style" by outsiders was reductive, but nevertheless revealing. See "Design Leadership Award," in *AIGA Graphic Design USA: The Annual of the American Institute of Graphic Arts*, vol. 3 (New York: Watson-Guptill Publications, 1982).

typography; simple, asymmetric layouts; and a modular grid system, among other features (fig. 1.5).<sup>27</sup> These modernist tenets would in turn influence, and later be transformed by, Cooper.

With the Office of Publications in good hands, Cooper was ready for new challenges. She applied in 1957 for a Fulbright fellowship to Europe. As she later reflected, on the decision to leave the Office: “I get bored very easily. I have a very low threshold for repetition.... I left because I was bored with the projects and with the work. I felt I knew enough about it and it was time to move on.”<sup>28</sup> This would be the first of Cooper’s many, self-initiated career moves, motivated by restlessness and a desire to seek out new problems. This, more than any formal characteristic as a designer, defined her work. Perhaps only half-jokingly, she also described her approach as a designer: “I do not use color very well, I don’t like detail very much.... I am much more grand sweep, I get the idea, I know it is going to work, and I move on.”

Cooper applied for a Fulbright fellowship to study in Italy, a country she saw as “engaged in a creative renaissance” yet firmly “in touch with its history.”<sup>29</sup> Her second choice was “Denmark and the Scandinavian countries.” She applied specifically to study exhibition design, which she considered “the most inclusive and perhaps the most pervasive of design tools.” As her draft application materials show, she envisioned being based in Milan, at the Polytechnic, and meeting or even collaborating with important designers such as Alberto Carbone, Max Huber, Bruno Munari, Giovanni Pintori, and Gio Ponti. She planned to see design offices such as the renowned Studio Boggeri, and the in-house teams of Olivetti and Pirelli. She also hoped to

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<sup>27</sup> For an introduction to the so-called Swiss style, see Richard Hollis, *Swiss Graphic Design: The Origins and Growth of an International Style, 1920–1965* (New Haven: Yale University Press, 2006).

<sup>28</sup> Janet Fairbairn, “The Gendered Self in Graphic Design: Interviews with 15 Women” (M.F.A. Thesis, Yale School of Art, 1991). This and following quotation.

<sup>29</sup> Muriel Cooper, draft application materials for Fulbright Fellowship, Cooper Collection, 12-393. This and following two quotations.

visit major architecture magazines also known for their graphic design, like *Casabella* and *Domus*. Milan was one of Europe's most dynamic design centers in this period, in particular as a site of exchange for graphic designers from Switzerland, active in corporate design programs, especially for pharmaceutical companies, and editorial design.<sup>30</sup>

Leaving Casey to direct the Office of Publications in her absence, Cooper departed for Milan in September of 1957. The trip was not a success. She contracted hepatitis while there, thus keeping her bedridden, and returned home earlier than expected when her mother died of a brain tumor. Cooper did, however, take many photographs during her time in Italy, of which she was quite proud (fig. 1.6).<sup>31</sup> The pictures demonstrate her early interest in perceptual characteristics that would persist throughout her career. These snapshots, of street scenes and shop windows, show an interest in abstraction and dynamism, mobile and non-traditional viewpoints points, and transparency and reflectivity.

In Cooper's absence, Casey expanded the Office staff. In 1957, Ralph Coburn joined the Office, after Casey had seen a show of his paintings at Boston's Mirski Gallery.<sup>32</sup> Coburn had studied architecture as an undergraduate at MIT in the early 1940s. In spite of the school's Beaux-Arts curriculum, he absorbed modernist impulses in architecture in part by working with his classmate, Walter Netsch, and attending some of Walter Gropius's lectures at the Harvard

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<sup>30</sup> On the Swiss-Italian exchange, see Museum für Gestaltung Zürich, *Zürich - Milano* (Baden: Lars Müller, 2007). And Andres Janser and Barbara Junod, eds., *Corporate Diversity: Swiss Graphic Design and Advertising by Geigy, 1940–1970* (Baden: Lars Müller, 2009).

<sup>31</sup> Multiple prints from the Milan trip, and photographs showing these works displayed in her home, appear in Cooper's papers. Cooper also comments that she was proud of her own photography in Fairbairn, "The Gendered Self in Graphic Design," n.p.

<sup>32</sup> Mattill, interview.

Graduate School of Design.<sup>33</sup> After being called to military service and then discharged for poor vision, Coburn returned to MIT only to withdraw from the architecture program and turn to painting full-time. He had a lifelong relationship with Ellsworth Kelly, whom he met while working at Mirski Gallery: the two lived in Paris together, where they made multiple visits to the studio of Hans Arp, met John Cage and Alice B. Toklas, and were both introduced to the artistic potential of chance-based operations. Coburn and Kelly seem to have influenced one another, and Coburn brought his aesthetic of hard-edge abstraction and bold color to his designs for the Office of Publications, where he worked until his retirement in 1988 (fig. 1.7).<sup>34</sup>

In the late 1950s, the Office of Publications began inviting young European designers to visit MIT. They would arrive in winter to manage the crush of design work for summer session brochures, and remain through early spring. This program, initiated by Mattill, thereby introduced some of Europe's progressive design influences to MIT. One of the first of these visitors was the Austrian Georg Teltscher, then going by the name George Adams, who had studied at the Bauhaus in Weimar. In 1959, the office received an essential stimulus toward the development of a so-called "MIT style." Casey recalls:

Therese Moll, a young Swiss designer, was the critical visitor. She introduced the office to European typography. She had been well-trained in the design [of] modular systems. This use of proportions in designing publications series became a useful tool for developing MIT's image. Although much has been modified by time, technology, and the work of

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<sup>33</sup> See David Hall, *Ralph Coburn: Convictions* (Wellesley, MA: David Hall Fine Art LLC, 2013).

<sup>34</sup> Coburn's influence appears to have been transformative for Kelly, who had until that point been somewhat ambivalent about abstraction: "Something happened during the summer of 1949, however, that had a liberating effect on Kelly. Ralph Coburn, a friend from Boston, came over to France in June for a vacation. Coburn, now a painter and designer for the M.I.T. Press [sic.] in Cambridge, Massachusetts, had heard about automatism and various other devices that had become popular among avant-garde artists in New York. The New York artists had in turn got them from the Surrealists, especially Masson and Matta, who had passed the war years in America." [Coburn was not yet working at MIT at this point, but rather studying; when he was working there, almost a decade later, it would be at the Office of Publications, not the Press.] E. C. Goossen, *Ellsworth Kelly* (New York: Museum of Modern Art, 1973), 19.

other designers in the office, the basics that Therese brought with her are still operating today.<sup>35</sup>

While Casey was already practicing precepts of what she called “European typography” before Moll’s arrival, learned secondhand from publications, working directly with her would prove formative. Indeed, Casey would long remember her two major design influences as being Cooper, on the one hand, and Moll, on the other.<sup>36</sup> Yet the lines of influence would also point from Moll, via Casey, to Cooper, who absorbed aspects of Moll’s Swiss training.

Moll studied at the Allgemeine Gewerbeschule in Basel, from 1949–54, under the legendary Swiss designers Armin Hofmann and Emil Ruder (both of whom later had a great influence on Cooper through their writing, and Hofmann and Cooper would subsequently interact in person<sup>37</sup>). Moll worked at Studio Boggeri in Milan (a planned destination for Cooper), with Karl Gerstner (with whom she also had a romantic relationship), and in the office of Geigy Pharmaceuticals, where she produced some of her first independent work (fig. 1.8). Though Cooper was employed by MIT while Moll was there, she no doubt learned of Moll’s work through Casey— both about the work Moll produced while at MIT, and perhaps also any portfolio materials that had circulated there before her arrival. Cooper might also have encountered Moll, knowingly or not, elsewhere: Hofmann was so impressed by Moll’s student

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<sup>35</sup> Dietmar R. Winkler, ed., *Posters: Jacqueline S. Casey*, 17.

<sup>36</sup> Ellen Lupton, ed., *MIT/CASEY* (New York: Herb Lubalin Study Center of Design and Typography, 1989).

<sup>37</sup> See Armin Hofmann, *Graphic Design Manual: Principles and Practice* (New York: Reinhold, 1965). Emil Ruder, *Typographie/Typography* (Niederteufen, Switzerland: Verlag Niggli AG, 1967).



work from his Basel *Vorkurs*, or preliminary course, that he published it more than once—without credit—as exemplary of his pedagogy (fig. 1.9).<sup>38</sup>

The Office’s third full-time designer was Dietmar Winkler, who came from Germany. After graduating from his design program in Hamburg in 1957, Winkler worked at a German pharmaceutical company. He spent a year at the Rhode Island School of Design, and then worked as an art director and designer in Boston. He worked at MIT from 1965 to 1970, where he served an essential role not just in producing elegant, European-style typography for the Office, but also in tutoring his colleagues, who had not been trained in typography or print production, on the rudiments of the craft.<sup>39</sup> Winkler went on to be Design Director in the inventive offices of WGBH-TV in Boston, and to teach at both the Illinois Institute of Technology and the University of Massachusetts at Dartmouth.<sup>40</sup>

## **Freelance**

On returning from Milan, in 1958, Cooper established a studio in her house in Brookline to serve clients in and around Boston. She called it Muriel Cooper Media Design.<sup>41</sup> As her sister Charlotte, who had also moved home at this time, recalls, Cooper took over the downstairs for her work, creating chaos aided by her unruly pet dog, working into the wee hours, and making a

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<sup>38</sup> Letter from Dorothea Hofmann to Elizabeth Resnick, April 2, 2015, courtesy of Elizabeth Resnick. See forthcoming article by the author and Resnick on Moll and the Swiss-style at MIT in *Design Issues*.

<sup>39</sup> For more on Winkler, see Heller and D’Onofrio, *The Moderns*, 106.

<sup>40</sup> Dietmar R. Winkler, ed., *Posters: Jacqueline S. Casey*, 9.

<sup>41</sup> The name of this business, for including “media design,” anticipates Cooper’s later career. It is both out of step with the terminology of design practices at that moment and, admittedly, overbroad given what Cooper was, in fact doing, which was primarily traditional publication design.

household activity of cooking, with greater or lesser success.<sup>42</sup> In her freelance practice, Cooper designed logotypes and stationery systems for the Air Force Cambridge Labs, Cambridge's Technology Square, the Boston Redevelopment Authority, and the Sylvania company. She also worked with Amherst, Radcliffe, Simmons, and Wellesley colleges; the New England College Fund; Peter Bent Brigham Hospital and the Children's Hospital Medical Center; the Greater Boston Economic Study Committee; and Cabot, Cabot and Forbes, a Boston real estate firm. During this time she also taught. Cooper was a design instructor for Boston University's night classes in 1959–60, and was an Associate Professor of Design at her alma mater, the Massachusetts College of Art, where she taught intermittently, starting in 1962.

Back at MIT, the Institute's publishing imprint, the Technology Press, became independent and reorganized itself as the MIT Press in 1962. The Technology Press had been established in 1932 as an editorial arm of the large publisher John Wiley & Sons. MIT's publishing program was distinguished for its even balance of titles in science, math, and engineering, on the one hand, and humanities and social sciences on the other. As a university press, MIT's books were traditionally reviewed by editorial boards comprised of faculty members. Criteria for selection were based on scholarly merit rather than sales potential. Circulation was also comparatively smaller than commercial presses. This "short run publishing" often produced some 500–2,000 books, intended primarily for scholars. As American university press sales grew immensely beginning in the 1960s, the MIT Press would experience some of the largest growth, in sales and in number of titles.

The director of the newly christened MIT Press, Carroll Bowen, who had joined that fall, immediately sought out a designer, both to give the new imprint a graphic identity and to design

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<sup>42</sup> Lopoten, interview.

titles for it. Bowen believed that the press needed to improve the quality of, and create some consistency amongst, strong academic titles that were nevertheless, in his words, “ugly ducklings.”<sup>43</sup> In a letter to Cooper’s friend Tom Wong, written shortly after her death, Bowen explained his process of finding a designer, namely by consulting America’s foremost practitioner in the field:

Never wanting for gall, I phoned Paul Rand asking for design assistance. He answered his own phone and invited us down for lunch to discuss the project. Harold Chevalier, the production director for the Press, and I motored down to Connecticut bringing along a baker’s dozen of the Press’s more and less designed books including a few monographs.

Tell us, I asked Rand, how to make typewriter monographs beautiful. Rand, generous in all regards (I recall him paying for the lunch) said, “Go home to Boston. Here are the names of three designers at work in the region for whom I have a high regard. Find one whose ideas excite you and who you can work with, and grow a relationship.”

Cooper, who already had some history at MIT, was one of these designers (there is no record of who the others were). Rand had met Cooper when she was seeking a job in New York immediately after graduating, and her work appears to have made an impression.<sup>44</sup> Bowen contacted her, and organized a small competition among the candidates to design a graphic identity for the Press. The mark that Cooper designed is now well-known, but the process leading up to it is quite revealing. Presentation boards in Cooper’s archives indicate that she pursued multiple, rather less elegant directions for the symbol (fig. 1.10). These include more

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<sup>43</sup> Carroll Bowen to Tom Wong, August 31, 1994. Cooper Collection, 12-205. This and following quotation. Thomas J. Wong (1930–2000), who studied at the Massachusetts College of Art and went on to serve for two decades as a designer and architect for the Museum of Fine Arts Boston, organized a memorial exhibition in Cooper’s honor at MIT in 1994 and arranged for her archives to be deposited at their alma mater.

<sup>44</sup> Cooper’s papers indicate that she attempted to schedule a meeting with Rand to show her work in the fall of 1948. Only Rand’s response survives, indicating that he would not be in New York at the time, but that he could meet with her upon his return. Paul Rand to Muriel Cooper, August 27, 1948, Cooper Collection, 12-284. Cooper apparently also contacted Alexey Steinweiss, another Brooklyn-born Jewish designer with Eastern European roots, at around the same time. Steinweiss was famous for his record album covers for Columbia, Decca, RCA, and other studios, from the late 1930s to the early 1970s.

legible wordmarks with more literal imagery, such as the heraldry of an open book, script lettering suggesting a sine wave, and thick, meandering lines forming the initials of the Press. The design directions are disparate, and none nearly as successful as today's mark.

The final direction, what Cooper allegedly called the “pure one,” was comprised of seven thick, vertical lines in a row, like abstracted books on a shelf, forming the vertical strokes of the lowercase letters “mitp” (fig. 1.11). One bar is raised to form the extender of the “t,” another lowered to form the descender of the “p.” Bowen was thrilled with the solution, and found the mark appropriate to the spirit of MIT and the Press: “The basic materials were supplied, but intelligence and imagination... produced the end result, information with elegance.”<sup>45</sup>

The mark, assembled from a minimal kit of parts, resembles the kinds of design exercises assigned in a modernist preliminary course, in which students must dispose squares or lines within a grid to evoke different effects, whether of dynamism, equilibrium, or otherwise. Indeed, Armin Hofmann used such an exercise in his *Vorkurs* at Basel. In the section of his seminal *Graphic Design Manual* dedicated to line, he glosses these exercises by explaining that “Certain parts are blanked out from the lattice grid of bars. This gives rise to both black and white figures of equal quality. Themes: steady in the middle; marked contrasts; various groups; up and down.”<sup>46</sup> He likewise shows how these lines can also be used representationally in the next two examples, one forming the head of a violin, another—with the small embellishment of pencil points suggested by triangles—in a design for a pencil factory. These examples (some apparently by Therese Moll), earlier printed versions of them, or ones that were similar, were very likely

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<sup>45</sup> Bowen to Wong.

<sup>46</sup> Hofmann, *Graphic Design Manual: Principles and Practice*, 90–91.

known to Cooper, and may help to explain the seemingly revelatory “pure” direction, or at least the milieu from which it developed.

## **Rand and Cooper**

After recommending Cooper for her role, Rand seems to have had little interaction with her. Nevertheless, viewing them in comparison is instructive. When consulted by Bowen, Rand was, and would for the century remain, America’s preeminent graphic designer. Indeed, already in 1938, at the age of just 24, *PM* magazine declared him the most promising influence on graphic design in America.<sup>47</sup> None other than Moholy-Nagy, whose work captivated Rand when he discovered it in the pages of the journal *Gebrauchsgraphik*<sup>48</sup> and England’s *Commercial Art*<sup>49</sup>—encounters which formed his true education, he claimed, rather than the fairly conservative lessons he learned at the Pratt Institute—praised Rand in 1941 as the vanguard of a new generation in America. Moholy wrote: “He is an idealist and a realist, using the language of the poet and businessman. He thinks in terms of need and function. He is able to analyze his problems but his fantasy is boundless.”<sup>50</sup> Rand’s first book, the 1947 volume *Thoughts on Design*, published when he was just 33, became an instant classic.

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<sup>47</sup> Steven Heller, *Paul Rand* (London: Phaidon, 1999), 12.

<sup>48</sup> The full name of the bilingual journal was *Gebrauchsgraphik, Monatschrift zur Förderung künstlerische Reklame* (Commercial Graphics, Monthly Magazine for Promoting Art in Advertising). *Gebrauchsgraphik* was published in Berlin from 1924–44, and then relaunched in Munich in 1950. Jeremy Aynsley writes that it “was one of the first-generation graphic design journals in Europe,” and that it “published some of the first reviews of an activity still to be termed ‘graphic design’....” See Jeremy Aynsley, “*Gebrauchsgraphik* as an Early Graphic Design Journal, 1924–1938,” *Journal of Design History* 5, no. 1 (1992): 53–72.

<sup>49</sup> It was in the London-based journal *Commercial Art* that Rand read Jan Tschichold’s “New Life in Print” (1930), a recapitulation of Tschichold’s approach to “The New Typography,” and also learned of avant-garde European designers such as Piet Zwart, Kurt Schwitters, El Lissitzky, Max Burchartz, Ladislav Sutnar, Walter Dexel, and Wilhelm Deffke. Heller, 22.

<sup>50</sup> Heller, 31.

While Cooper's own trajectory would be quite different than Rand's, there were aspects of commonality. Cooper's earliest work shows the lighter touch and illustrative style that Rand brought to much of his design. Rand was likewise crucially influenced by the European avant-gardes, and indeed was one of the key figures in adapting some of their formal lessons into mainstream American publishing and advertising. Marking his distance from mid-century American commercial art and advertising culture, Rand reflected that when he was designing the covers of *Direction*—an anti-fascist magazine he worked with from 1938–45, in one of his first and last politically charged engagements—he “was trying to compete with the Bauhaus, not with Norman Rockwell. I was trying to compete with Van Doesburg, Leger and Picasso.... Compete isn't the right word. I was trying to do it in the spirit.”<sup>51</sup>

Like the modernist typographer Jan Tschichold, whose 1930 essay “New Life in Print” influenced Rand early on, and who had argued that one can use every typeface, even antique ones, while still being modern<sup>52</sup> (a rather more moderate position than that of Tschichold's book *The New Typography* of two years earlier<sup>53</sup>), Rand believed typography could be new or old, so long as it was used well.<sup>54</sup> Likewise, while Cooper was later associated with the sans serif Swiss typeface Helvetica, her eclectic tastes and unfussy sensibility show that she was not doctrinaire, like many of her more committed modernist colleagues.

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<sup>51</sup> Ibid.

<sup>52</sup> Jan Tschichold, “New Life in Print,” in *Looking Closer 3: Classic Writings on Graphic Design*, ed. Michael Bierut et al. (New York: Allworth Press, 1999). Originally published in *Commercial Art* (London: July 1930).

<sup>53</sup> Jan Tschichold, *Die neue Typographie: Ein Handbuch für zeitgemäss Schaffende* (Berlin: Bildungsverbandes der deutschen Buchdrucker, 1928). Translated into English as Jan Tschichold, *The New Typography: A Handbook for Modern Designers* [1928], trans. Ruari McLean (Berkeley: University of California Press, 1995).

<sup>54</sup> Paul Rand, *Thoughts on Design* (New York: Wittenborn and Company, 1947).

Yet the comparisons should end there. Rand, a dyed-in-the-wool modernist, was increasingly resistant to change over the course of his life. Like Gyorgy Kepes, he spoke often of “chaos,” albeit with more pointed political implications. Referring to Rand’s 1992 screed “Confusion and Chaos: The Seduction of Contemporary Graphic Design,”<sup>55</sup> and his resignation in protest from the Yale School of Art following the appointment of Sheila de Bretteville as head of the graphic design program, Ellen Lupton has written:

In an angry manifesto published in the *AIGA Journal of Graphic Design*, Rand railed against the violation of modernism by screaming hordes of historicists, deconstructivists, and activists. Behind each of these challenges to modernism stood a powerful woman: behind historicism was Paula Scher, behind deconstructivism was Katherine McCoy, and behind activism was Sheila Levrant de Bretteville.<sup>56</sup>

Cooper was not among these women, but might have been for representing technology, for which Rand also harbored skepticism. Though he was invited to the MIT Media Lab in 1996 to deliver what would be his last lecture—and subsequently given a teaching appointment, though he was unable to fulfill it because of his death just two weeks later—Rand was skeptical of the increasing role of computers in graphic design.<sup>57</sup>

Finally, in his fame and reputation for artistry—he was known for conspicuously signing his work, whereas commercial artists had once been invisible—Rand represented a model of the graphic designer as storyteller and crafter of individual objects and messages from which Cooper would later depart. If Rand modeled the graphic designer of midcentury America, Cooper would later come to represent the designer of the next century.

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<sup>55</sup> Paul Rand, “Confusion and Chaos: The Seduction of Contemporary Graphic Design,” *AIGA Journal of Graphic Design* 1, no. 1 (1992), [http://www.paul-rand.com/foundation/thoughts\\_confusionChaos/#.VjZ6j6J\\_4nI](http://www.paul-rand.com/foundation/thoughts_confusionChaos/#.VjZ6j6J_4nI).

<sup>56</sup> Ellen Lupton, “Colophon: Women Graphic Designers,” in *Women Designers in the USA, 1900–2000: Diversity and Difference*, ed. Pat Kirkham (New Haven, CT: Yale University Press, 2000), 376.

<sup>57</sup> Heller, *Paul Rand*, 240.

## *Communication by Design*

Cooper's work was recognized in 1964 as part of the group exhibition *Communication by Design*, organized by the Addison Gallery of American Art. The show forms a revealing snapshot of the American design scene, or at least that of the northeast, at that moment. Cooper shared the spotlight with three other, significant designers: Malcomb Grear, Norman Ives, and Carl Zahn. Cooper designed the cover of the square format exhibition booklet (fig. 1.12).<sup>58</sup> She filled the page with the capital Roman letterforms of the exhibition title, but jumbled, with the correctly ordered letters picked out, each in one of four colors. The properly ordered title of the show appears on the bottom two lines, and the four artists' names are set beside it in a left-aligned block of Helvetica type. This visual puzzle suggested a play of signal and noise, in which the designer offered the essential filter for communicative sense-making, while also combining classical and modern letterforms. Both features evinced Cooper's playful sensibility.

The book's layout, based on a flexible grid with sans serif type and rhythmically disposed images, is the work of Cooper's Boston-based colleague Carl Zahn, a crucial advisor to Cooper on questions of design and production at the MIT Press, as he was to MIT's Office of Publications before that (Zahn was also responsible for the photograph of Cooper reproduced in the book).<sup>59</sup> The book's foreword, by the art historian and longtime director of the Addison

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<sup>58</sup> Addison Gallery, *Communication by Design: Muriel Cooper, Malcolm Grear, Norman Ives, Carl Zahn* (Andover, MA: Addison Gallery of American Art, 1964).

<sup>59</sup> Though self-taught in typography, Zahn was an outstanding designer who worked in the Institute of Contemporary Art Boston's design department from 1951–6 (likely overlapping with Cooper), and for Boston's Museum of Fine Arts thereafter. See biography in *Communication by Design*, n.p. Dietmar Winkler has emphasized Zahn's unsung importance as an informal consultant to both the Office of Publications and the MIT Press on questions of typography and production. Zahn's interest in typography was broad and, according to Winkler, he knew the proprietors of the major European type foundries, as well as the legendary typographers and calligraphers Hermann and Gudrun Zapf. Dietmar Winkler, email to author, November 27, 2017. Zahn's knowledge and his relationships are evident in the 1970 MIT Press edition of Hermann Zapf's seminal 1954 *Manuale Typographicum*: "Additional technical explanations of the 100 typographic pages," it is explained, "have been added to this edition by Carl Zahn, Boston." See Hermann Zapf, *Manuale Typographicum* (Cambridge, MA: MIT Press, 1970).



Gallery, Bartlett H. Hayes Jr., attempts to distinguish information as such from the intentional disclosure of *communication*.<sup>60</sup> A design, as “a reasoned composition of gestures,” he argues, can also reveal the individual style and personality of its designer, beyond its immediate function to inform. For this work to be “acknowledged as art,” he wrote, “there must be overtones of personal poetic insight.” Hayes added: “The dividing line is very fine between a work of art which is shaped for functional, or commercial, reasons and one created as an end in itself.... Both kinds are represented in this exhibition which is composed of work by four artists.”

Cooper was represented in the show by her work for the Office of Publications, including summer session brochures and a record album sleeve for a concert at MIT’s Kresge auditorium (fig. 1.13). A purely typographic MIT Press book cover design by her, for the Harvard sociologist Nathan Glazer’s seminal 1963 *Beyond the Melting Pot*, is also shown. Some of Cooper’s freelance work appeared, such as publications for the Simmons College magazine and the Boston real estate firm Cabot, Cabot and Forbes. The work is fairly eclectic, and shows a liberal use of various typefaces and a persistent interest in the appearance of dynamism, whether in the photomontage repetition and offsetting of brass instruments on the record album sleeve or the vaguely diagrammatic circles and arrows on the cover of a *Simmons Review*. Five of her logotypes were also reproduced. These included the new design for the MIT Press alongside ones for Cambridge’s Technology Square, the Air Force Cambridge Research Laboratories, and symbols for Sylvania and the Boston Redevelopment Authority. Each of them takes its cue from the crisp, geometric simplicity of the MIT Press logo.

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<sup>60</sup> Communication by Design, n.p.

### *The View from the Road*

Cooper's first major title for the MIT Press, still as a freelancer, was the landmark urban planning book *The View from the Road*, by Donald Appleyard, Kevin Lynch, and John R. Meyer, of 1964 (fig. 1.14).<sup>61</sup> The publication was sponsored by the Harvard-MIT Joint Center for Urban Studies, which had been founded in 1959 to foster interdisciplinary dialogue between the two institutions on pressing issues of urban planning; its coauthors were all professors of city planning and/or architecture at MIT. *The View from the Road* followed, and extended much of the logic of, Kevin Lynch's 1960 work *The Image of the City*, published by the MIT Press's predecessor, The Technology Press.<sup>62</sup> In that book, Lynch had argued for the "imageability" of cities, or for their planning to take memorable shape and to employ useful means of wayfinding through built form. Following a 1954 study trip to Italy, with a grant from the Ford Foundation, Lynch argued for the emulation of certain aspects of the medieval city. He took three American cities as his case studies (Boston, Jersey City, and Los Angeles), and posited a set of design elements by which users could find their way. This research was based on Lynch's project with his colleague Gyorgy Kepes (the two had first met when they were both working in Chicago) on "The Perceptual Form of the City," pursued from 1954–9, and supported by the Rockefeller Foundation. This project considered the sensory apprehension of cities for the mobile viewer. This notion of taking the city as a total form, a set of relationships, emerged from Kepes's indebtedness to Gestalt psychology. A part of his larger project of opposing "visual disorder," Kepes collaborated with Lynch to think of cities in terms of the sequence of images presented to

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<sup>61</sup> Donald Appleyard, Kevin Lynch, and John R. Myer, *The View from the Road* (Cambridge, MA: MIT Press, 1964).

<sup>62</sup> Kevin Lynch, *The Image of the City* (Cambridge, MA: Technology Press, 1960).

viewers in motion.<sup>63</sup> Lynch's intellectual debt to Kepes is underscored by an inscribed copy of *The View from the Road*, which reads: "To Gyorgy— You are behind this, as usual! Kevin."<sup>64</sup>

*The View from the Road*, the authors announce, is about "the esthetics of highways, the way they look to the driver and his passengers, and what this implies for their design."<sup>65</sup> The audience for the book was the designer of this infrastructure: "this monograph is addressed to the highway engineer," they write. The authors' project emerges "out of a concern with the visual formlessness of our cities," and they argue that better highway design "might be the best means of re-establishing coherence and order on the new metropolitan scale." The problem of highway design was, in short, "the problem of designing visual sequences for the observer in motion."

In her design, Cooper sought to give form and coherence to a heterogeneous set of research materials, and to grant nearly equal prominence to visual and verbal material. The different elements of the book included text, drawings, diagrams, and photographs. Cooper's task was, like that posed to highway designers, to create dynamic visual sequences, albeit for a stationary reader rather than a moving driver. The long format book used a flexible three column grid and disposed material within it in a rhythmic fashion and with ample white space. There are multiple paths through the book: the drawings in the outside bottom corners of each page can form a flipbook sequence that animates the driver's changing views through the windshield; arrows in the body text, alongside a column of photographs or a film strip, indicate that the material is to be read top to bottom or bottom to top, accordingly; and drawings shown in sequence suggest a simultaneous unfolding of views on the page. Many of these novel devices

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<sup>63</sup> Judith Wechsler, *Gyorgy Kepes: The MIT Years, 1945–1977* (Cambridge, MA: MIT Press, 1978), 12.

<sup>64</sup> This inscribed copy was recently acquired by the Avery Architectural and Fine Arts Library at Columbia University, and is held in the Classics Collection (call number AA9052 Ap52 F c.2).

<sup>65</sup> Appleyard, Lynch, and Myer, *The View from the Road*, 2. This and following quotations in paragraph.

were created by Lynch himself. But Cooper also went to great pains in her design to give equal weight to visual and verbal material, to create dynamism in a static form, and to create a non-linear reading experience by juxtaposing diverse elements.

The book was one of the first to bear Cooper's colophon on its spine. The front cover, divided horizontally, shows a photographic view through the windshield of a car in the bottom register, and a black field in the top one, beginning roughly where the car's roofline would. The top field bears the book's title and authors as if they were titles in a film. The photograph by the authors shows heavy traffic of tailfinned cars in both directions and the urban fabric of New York City ahead, with both 19<sup>th</sup> century industrial buildings and newer, monumental infrastructure. The rearview mirror looms, dominating almost half the frame and showing the closer-than-they-appear cars behind. The view recalls Cooper's own photographs from Milan as well as the research photographs from Robert Venturi and Denise Scott Brown's 1968 studio trip to Las Vegas; indeed, the authors allegedly admired Cooper's design for *The View from the Road*, though they would despise her treatment of their 1972 publication, *Learning from Las Vegas*.<sup>66</sup>

The book's intended audience however, apparently did not appreciate the design. According to Cooper: "The author [sic] hated it— it was out of the reach of the engineers. Too big, arty."<sup>67</sup> But the book did garner an award at the annual design award show of the American Association of University Publishers (AAUP). In her statement for the award, Cooper explained the design as follows:

The long and narrow format was determined by the vertical nature of the drawings predominant in the book and vital to the authors [sic] concept. The column treatment was

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<sup>66</sup> Vinegar, 139.

<sup>67</sup> Lupton, "Muriel Cooper," n.p.

devised to accommodate the flip drawings, the complex annotations to the text, and the non-narrative structure of the text.... all to allow the greatest flexibility within a modular relationship. In this book I felt it appropriate to establish an experience of simultaneity which would, hopefully, visually emphasize and amplify the excitement and provocative ideas it contained.<sup>68</sup>

It was the first of only a few of Cooper's large, signature book designs, but its principles would inform those that followed. The book was in many ways an ideal assignment, and an early example of Cooper's cinematic approach to book-making: The authors use the phrase "vision in motion" several times throughout the book, as if to allude to Moholy-Nagy's work of that name (the line of influence, via Kepes, is direct).<sup>69</sup> "This study," they write, "was motivated by the promise of the new world of vision inherent in our speed of movement, and by a desire to find a visual means of pulling together large urban areas." Likewise: "The experience of a city is basically a moving view," they argue, "and this is the view we must understand if we wish to reform the look of our cities."<sup>70</sup> This dynamic perspective, of the "'automobilized' observer,"<sup>71</sup> in Martino Stierli's phrase, would inform Cooper's work for the rest of her career. In her words:

Actually, books are very experiential when done well.... They are visual space experiences through which the reader moves from page to page. The designing of books as visual experiences, as opposed to classic typographic presentations, has grown tremendously in the last 15 years, but this position is still being secured.<sup>72</sup>

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<sup>68</sup> Muriel Cooper to Eugenia Porter [AAUP], typescript letter, undated, Cooper Collection, 12-393.

<sup>69</sup> László Moholy-Nagy, *Vision in Motion* (Chicago: Paul Theobald, 1947).

<sup>70</sup> Appleyard, Lynch, and Myer, *The View from the Road*, 63.

<sup>71</sup> Martino Stierli, *Las Vegas in the Rearview Mirror: The City in Theory, Photography, and Film* (Los Angeles: Getty Research Institute, 2013), 149.

<sup>72</sup> Muriel Cooper, quoted in P.D.D., "Muriel Cooper," 38.

## Chapter 2. MIT Press Designing a Publishing Program

### *The Bauhaus*

In 1967, Cooper joined the MIT Press full-time as its first Design and Media Director. As she explained, given the growing number of freelance projects for the Press, her studio “had to either get much bigger to the exclusion of other things, or had to be made much smaller to make room for other interests. Meanwhile, the Press had developed a variety of design challenges, so I joined the Press to get at the ultimate informational design problem, the book.”<sup>1</sup> That year, she began work on her largest project, and the one that she would consider her calling card for years to come. *The Bauhaus: Weimar, Dessau, Berlin, Chicago* (fig. 2.1), was published in Fall 1969.<sup>2</sup> In its nearly 700 pages, the book contains some 200 archival documents and 800 illustrations relating to the legendary German school of art and design. The book measures, including its slipcover, 14<sup>1/4</sup>” tall, 10<sup>1/4</sup>” wide, and 2<sup>1/2</sup>” thick, tipping the scales at about 12 pounds. *The Bauhaus* remains in print as the authoritative collection of archival material on the subject.<sup>3</sup> While Cooper spent some two years designing the book, the story of its gestation as an MIT Press project extended back eight years prior. Likewise, the book’s afterlife in other media, both realized and conceptual, extended many years out from its publication.

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<sup>1</sup> Muriel Cooper, quoted in P.D.D., “Muriel Cooper: Finding Room Within Publishing to Explore the Outer Horizons of Book Design,” *Publishers Weekly*, December 6, 1976, 37.

<sup>2</sup> For more on the design and afterlife of this book, see Robert Wiesenberger, “Latter-Day Bauhaus? Muriel Cooper and the Digital Imaginary,” in *Before Publication: Montage in Art, Architecture, and Book Design. A Reader*, ed. Martino Stierli and Nanni Baltzer (Zurich: Park Books, 2016), 93–107. The term “digital imaginary” is inspired by and indebted to Noam Elcott’s use of the “cinematic imaginary.” See Noam M. Elcott, “Into the Dark Chamber: Avant-Garde Photographs and the Cinematic Imaginary” (Princeton University, 2009).

<sup>3</sup> A new edition of the book appeared in June 2015.

## *Archive*

The Bauhaus Archive (*Bauhaus-Archiv*) was established in Darmstadt, Germany in 1961—before moving to its current location in Berlin in 1971—with the art historian Hans Maria Wingler as its founding director. In 1962, the tome *Das Bauhaus, 1919–1933: Weimar, Dessau, Berlin* was released in German, edited by Wingler, and comprised of the essential documents from his research (fig. 2.2).<sup>4</sup> It was this book that in revised, expanded, and redesigned form would later appear from the MIT Press. The German book’s publisher, Gebrüder Rasch, was created for the purpose of releasing the book by the entrepreneur Emil Rasch, whose family company (Rasch Tapeten) began manufacturing wallpapers under the Bauhaus name in the 1920s.<sup>5</sup> Rasch believed in the need for an “independent and objective view of the Bauhaus,” apart from that of its protagonists.<sup>6</sup> Surprisingly few synthetic accounts of the school existed, even by the 1960s, and even fewer of its primary documents were widely accessible, in no small part due to the dislocation of many of its members and limited access to materials in a divided Germany. Naturally, even less information was available at this time in English, which helps to explain the ecstatic response to the book’s translation in 1969. Indeed, it seemed to come in response to Alfred Barr Jr.’s hope, in his preface to the 1938 Museum of Modern Art catalogue *Bauhaus, 1919–1928*, that in future “a definitive work on the Bauhaus should be written, a well-ordered, complete and carefully documented history prepared by a dispassionate authority.”<sup>7</sup>

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<sup>4</sup> Hans Maria Wingler, ed., *Das Bauhaus, 1919–1933: Weimar, Dessau, Berlin* (Bramsche, Germany: Gebrüder Rasch, 1962).

<sup>5</sup> The publisher and printer is today known as Rasch Druckerei und Verlag GmbH. See <http://www.rasch-verlag.de>

<sup>6</sup> Carroll Bowen to Emil Rasch, May 21, 1964, The MIT Press Acquisition Archive, Roger Conover Collection.

<sup>7</sup> Alfred Barr Jr., Preface to Herbert Bayer, Walter Gropius, and Ise Gropius, eds., *Bauhaus, 1919–1928* [1938] (New York: The Museum of Modern Art, 1975), 7.

*Das Bauhaus* was more a sourcebook than a history, as such. As Wingler described it in the preface to the English edition: “This presentation serves exclusively to supply source material. It would be most welcome if the material here presented would contribute to further intellectual studies.”<sup>8</sup> Exactly how dispassionate Wingler’s authority was is questionable, as both reviewers and even, confidentially, the book’s translator, suggested that his introductions to archival documents seemed to relitigate settled Bauhaus history, consistently in Gropius’s defense.<sup>9</sup> (For his part, Wingler stated that he had “made every effort to refrain from every subjective interpretation.”<sup>10</sup>) Nevertheless, this was the well-ordered, complete, and carefully documented book for which students, scholars, and practitioners in the arts seemed to have been waiting.

Wingler’s research to assemble the archive depended on both individuals and institutions. In particular, Walter Gropius, then residing in Lincoln, Massachusetts, was essential in establishing the Bauhaus Archiv. Wingler thanked him in the preface to the book not just for sharing his own extensive records but for soliciting others to do so as well, and reaching out to former colleagues on Wingler’s behalf: “Thanks to his confidence and his positive attitude it was possible to tap sources that otherwise would have remained closed.” Wingler also depended on Mies van der Rohe, particularly for the records from the Bauhaus in Berlin. For institutions, he

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<sup>8</sup> Hans Wingler, ed., *The Bauhaus: Weimar, Dessau, Berlin, Chicago* (Cambridge, MA: MIT Press, 1969), ix.

<sup>9</sup> Reyner Banham acknowledged this in his review of the English language translation, “*The Bauhaus*” [book review], *Art Quarterly* 34, no. 1 (1971): 110–13. The book’s translator, Wolfgang Jabs, did as well: “I wonder if he [Emil Rasch] is aware of the fact that his intentions of publishing an archive are defeated by the very subjective introductions to some of the documents. [...] The impression then is that Mr. Wingler is still fighting the Bauhaus cause against the rightist extremist opposition (a fight which has long been won) and several personal causes, for instance one against Hannes Meyer (of whom he does not publish much, but whom he judges a great deal).” Wolfgang Jabs to Carroll Bowen, December 22, 1964, Conover Collection.

<sup>10</sup> Hans Wingler to Carroll Bowen, January 20, 1967, MIT Press Acquisition Archive, Conover Collection.



relied on the Landeshauptarchiv in Weimar, whose collections, begun when the Bauhaus decamped to Dessau, formed the earliest institutional holdings on the school. Wingler likewise depended on multiple research visits to America, both to meet Gropius and to conduct research at Harvard's Busch-Reisinger Museum, which since the late-1940s had created a dedicated collection of Bauhaus materials, and in particular documentation.<sup>11</sup> While collections like those of the Museum of Modern Art in New York and the Stedelijk in Amsterdam had outstanding holdings of art and design objects related to the Bauhaus, Wingler's concern in this volume was primarily with documentation, which was at that time relatively weaker in these collections.

### *Das Bauhaus*

The original book's structure—retained in the English edition—consisted of two main sections, for text and images. A brief essay by the editor offered context at the outset; archival documentation, in many cases excerpts, formed the bulk of the book, proceeding chronologically from a “Prehistory” of the school to its demise in Berlin (the timespan of the German edition's title was 1919–1933); and a section of images followed, with more than 600 halftone reproductions of Bauhaus people and works. The design of the German edition is modern if workmanlike, and of a piece with postwar German graphic design practice.<sup>12</sup> It was later said by Bowen that none other than Herbert Bayer “had with many others had a hand in the design of the

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<sup>11</sup> See Robert Wiesenberger, “The Bauhaus and Harvard,” in *The Bauhaus*, online special collection for the Harvard Art Museums, <<http://www.harvardartmuseums.org/collections/special-collections/the-bauhaus>>, 2016.

<sup>12</sup> The book's colophon lists Urs-Victor Hammer and Klaus Hoffmeister as the designers, though no information on them could be found.

German edition,” but also that Cooper recognized the book—correctly—as “a camel of a design... a camel being a horse drawn by committee.”<sup>13</sup>

The layout of the book depends on a rigid three-column grid, with a narrow margin, into which dense, justified columns of text are set, with paragraphs separated neither by line breaks nor indentations. The image section is similarly regimented. The layout does use ample space, but at regular, templated intervals, such as under section headings. Perhaps tellingly, the book’s frontispiece, and the image on its dustjacket, is Oskar Schlemmer’s *Bauhaus Stairway* (*Bauhaustreppe*) of 1932. Painted three years after the artist had left the school, and immediately following the Nazis’ order to close the Dessau Bauhaus whose interior it depicts—with its subjects receding from view—it is perhaps the quintessential image of Bauhaus nostalgia.<sup>14</sup>

### *Translation*

The plan to produce an English language edition of *Das Bauhaus* began a full decade before it appeared in print, when Carroll Bowen was still at the University of Chicago Press. In letters to Wingler before the book’s release in German, Bowen expressed great interest in the project, and through his persistence, finally secured English-language rights to it after he had arrived at MIT.<sup>15</sup> From early on, there was institutional support for the book, even though it was clear—given its heft, and the rights and labor involved, that it was “going to be expensive and a money

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<sup>13</sup> Bowen to Wong.

<sup>14</sup> Andreas Huyssen calls the painting “a melancholy memorial” to the Bauhaus’s utopian ambitions. See Andreas Huyssen, “Oskar Schlemmer: Bauhaus Stairway, 1932,” in *Bauhaus 1919–1933: Workshops for Modernity*, eds. Barry Bergdoll and Leah Dickerman (New York: Museum of Modern Art, 2009), 318–21.

<sup>15</sup> Carroll Bowen to Hans Wingler, June 8, 1958, Conover Collection.

loser.”<sup>16</sup> Bowen insisted to Wingler, rather presciently: “I am convinced that our production of an English-language edition of *Das Bauhaus* will be one of the most important undertakings in the history of this Press.”<sup>17</sup>

Bowen’s conviction about the book emboldened him. The plan was originally to maintain the format and content of the German edition, and, in fact, Bowen had been advised to edit the volume down. Wolf von Eckardt, then art and architecture critic for the *Washington Post*, whom Bowen had solicited to advise him, and potentially to translate the book, admired the German edition but thought that it needed serious revision. He confided to Bowen:

There is little point in translating all the documents Wingler has gathered. A good half of them, I would say, illustrated the political struggles of the Bauhaus in far greater and more tedious detail than English readers will care about. There is a lengthy, name-studded report of the Appropriations Committee of the Thuringian legislature, for instance. Or the jury report on the libel suit against one of Gropius’ detractors. Such things have a certain fascination to those who are deeply involved. But along with some of the budgets they will mean little to people who couldn’t go to the German source for them.

Von Eckardt’s suggestion, then, was “that about half of the documents be omitted.”<sup>18</sup> Yet Bowen retained the archival breadth of the original, and indeed expanded it to update the story. The English edition added a ninth section, and about 100 pages, to chronicle the New Bauhaus and its successive phases in Chicago.

Von Eckardt was ultimately unavailable to translate the book. For that task, Gropius suggested Nikolaus Pevsner, and later, Lydia Dorner.<sup>19</sup> Both declined. A young German student

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<sup>16</sup> John Burchard to Carroll Bowen, February 7, 1963, p. 2, Conover Collection.

<sup>17</sup> Bowen to Wingler, November 10, 1967, Conover Collection.

<sup>18</sup> Wolf von Eckardt to Carroll Bowen, October 9, 1963, Conover Collection.

<sup>19</sup> Nikolas Pevsner to Carroll Bowen, April 9, 1963. Lydia Dorner to Carroll Bowen, February 17, 1964, Conover Collection.

of architecture at the Technische Universität in Berlin with excellent English skills, Wolfgang Jabs, was ultimately chosen for the task, and he worked closely with Wingler on the translation. Wingler drafted an additional section on the New Bauhaus in Chicago, its subsequent iterations as the School of Design and Institute of Design, and rather briefly, other successor institutions to the Bauhaus, such as the Hochschule für Gestaltung in Ulm. (Nevertheless, the primary emphasis with regard to the school's postwar legacy was on Chicago, rather than Ulm, likely both because the book was intended for English speaking audiences and, perhaps also in part because the translation had benefited from a grant from the Chicago-based Graham Foundation).

Preparing the English-language edition was an active negotiation with extant successor institutions and Bauhaus personalities. Indeed, the institutions listed beside the title page in the finished book, beginning with “1919–1925 Bauhaus Weimar” would end with an open date range, for the still-active school in Chicago: “1944–\_\_\_ Institute of Design.” Likewise, in late January 1969, as the book was set to go to press, Wingler wrote to MIT Press editor Joseph Stein that, in light of the recent closure of the Ulm School, a brief paragraph of eulogy should be added.<sup>20</sup> Likewise, in the year of the book's publication, both Gropius and Mies van der Rohe died. Some of the living protagonists also weighed in, such as Josef Albers, one of whose main pastimes appears to have been amending the record on his role at the Bauhaus, especially relative to Moholy-Nagy. Knowing that an English translation would be published by the Press, Albers asked the German Consulate General of Boston to contact MIT's Dean of Humanities, John Burchard, to revise a few points from the German edition, among them to note that Albers “worked and taught in the Bauhaus longer than any other member of it.”<sup>21</sup>

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<sup>20</sup> Hans Wingler to Joseph Stein, January 27, 1969, Conover Collection.

<sup>21</sup> Philipp Schmidt-Schlegel to John Burchard, February 21, 1964, Conover Collection.

Though the plan was originally to have the English edition closely resemble the German one in format, it was clear that neither Bowen nor Wingler was quite satisfied with the existing design. Bowen, who had shown his boldness in reaching out to major designers in the past (having found Cooper through Paul Rand), solicited Herbert Bayer, who was allegedly involved with the German edition, and whom he had gotten to know at the Aspen Design Conference, for his views on the design, and the two engaged in a friendly back-and-forth. Not only did Bayer agree that the design could be substantially improved, “to be more consonant with Bauhaus design concepts and styles,” as he told Bowen, but talks also began to see if Bayer might complete the redesign himself.<sup>22</sup> Bayer asked a few questions of the Press, such as what sans serif typefaces were available, what paper stocks he might choose from, whether the original color plates were still available and, importantly, whether the format might change.<sup>23</sup> Ideally, he would want to make the margin all around a little wider, as the large amount of text on each page “needs relief.” An alternative, if new plates were not available, would be to widen the margin by making the book larger. Yet he wished to avoid this, “as it is already a rather unhandy volume.”

In the end, Bayer was unavailable for the redesign. But Cooper, who had become design director the year these discussions were unfolding, took on the project. Cooper’s interest in the book was overdetermined: it was at once a topic of personal interest; an excellent test case for her design principles, both during and after its publication; and perhaps also a chance to prove herself, in her new role, with what was clearly a flagship title for the Press. “I was very fortunate to have been in the right place at the right time,” she reflected of her experience designing the

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<sup>22</sup> Bowen to Herbert Bayer, May 18, 1967, Conover Collection.

<sup>23</sup> Herbert Bayer to Carroll Bowen, June 20, 1967, Conover Collection.

book.<sup>24</sup> “The people and works of the Bauhaus were my conceptual and spiritual ancestors, so I felt a particular bond with the material.”<sup>25</sup> To be sure, as a self-identifying modernist coming up in Boston in the 1940s and 50s, the Bauhaus was vital to Cooper, and she enjoyed both direct and indirect exposure to avant-garde impulses, emanating especially from Harvard and MIT.<sup>26</sup> The degree to which her design solution for the book would reflect her “conceptual” debt to the Bauhaus, however, would later be the subject of debate.

Cooper’s design for *The Bauhaus* book made a virtue of its “unhandy” scale, and worked to monumentalize the subject. “Because the color plates had to be salvaged from other publications for economy’s sake,” she later explained, “they determined size constraints.”<sup>27</sup> While this appears to have been accurate, it also seems that Cooper might have used this technical argument to support what was essentially a design decision. Housing the book was a black slipcover, printed with BAUHAUS in massive white, Helvetica bold type, tightly spaced, across the full length of the cover. The slab of a book inside was a kind of negative image, its white covers bearing the same text in black. The full title and author appears on the spine, its information picked out in bold, and its fine, delicate print forming a scalar contrast with the text on the covers. Absent from the spine of the book, for some reason, was Cooper’s recent colophon for the Press. Yet the volume itself already formed a stark, stele-like object on its own. Present in the book, however, and exceptional among Cooper’s collaborative projects at the Press, was her name in the colophon: “Design by Muriel Cooper.” The book was a particular

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<sup>24</sup> Steven Heller, “Muriel Cooper” [interview], in *Graphic Design in America: A Visual Language History* (Minneapolis: Walker Art Center, 1989), 98.

<sup>25</sup> Heller, 97.

<sup>26</sup> Robert Wiesenberger, “The Bauhaus and Harvard.”

<sup>27</sup> Ibid.

labor of love for her, which lasted well beyond the three months' time budgeted, and into a two-year process.

The information directly below Cooper's name, that the book was set in Linofilm Helvetica, was also significant. While Helvetica had been released in Europe in 1957, and quickly became the standard typeface of "Swiss-style" modernism, it would only become available in the U.S. a decade later.<sup>28</sup> The choice of Helvetica aligned Cooper with this Swiss tradition. While it was surely an evolution of tendencies of the "New Typography" practiced at and in the orbit of the Bauhaus in the interwar period, Cooper's decision not to use a sans serif, geometrically constructed typeface of the period, such as Paul Renner's Futura (1926), or Herbert Bayer's Universal (1925), positioned the book as something more contemporary. This choice, and the purely typographic treatment of the book's exterior (as opposed to featuring the Schlemmer work, or some other Bauhaus artist), lent credence to its epigraph, from Mies van der Rohe, that "The Bauhaus was an idea." Indeed, in Cooper's hands, it was an idea of contemporary relevance.

When hoisted to a table, as the tome requires, and opened, the layout reveals a study in the interaction of rule and freedom, system and flexibility. As Cooper explained: "While the structure of the book evolved from the Swiss grid system, it was devised to be rich enough to encompass the complex panorama of the archival, textual, and visual material."<sup>29</sup> Cooper

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<sup>28</sup> Paul Shaw, *Helvetica and the New York City Subway System: The True (Maybe) Story* (Cambridge, MA: MIT Press, 2011).

<sup>29</sup> Heller, "Muriel Cooper" [interview], 97. Dietmar Winkler has noted that Cooper only realized the concepts of Swiss-style modular typography with the Bauhaus book— which is to say, belatedly given the history of Swiss typography generally, and its use at MIT specifically, in the Office of Publications. Dietmar Winkler, email to author, November 27, 2017. A "modular" typographic grid entails regular horizontal divisions of the page, in addition to vertical columns, in order to create modules for content. The classic handbook for this approach, by its great practitioner, is Josef Müller-Brockmann, *Grid Systems in Graphic Design: A Visual Communication Manual for Graphic Designers, Typographers, and Three Dimensional Designers = Raster Systeme für die visuelle*

implemented a flexible three column grid system for the layout. In the first section of the book, “The Documents of the Bauhaus,” which comprises about a third of its bulk, body text fills the right hand two thirds of the page, and information on the documents—including author, title, source, and a sentence or two of gloss—floats in the left-hand column, flush with the start of each one. Diverse documents are given flat, equivalent treatment. Paragraphs are separated only by a single line of clear space, and, in the German style, paragraphs within documents are separated only by a line break, rather than an indentation or other separation from the foregoing text. The result of this density, and its contrast with the ample expanses of crisply defined negative space, is to create what some interwar typographers might have praised as an “architectonic” effect on the page, by which was meant, if always somewhat vaguely, some kind of planar and orthogonal interplay of solid and void.<sup>30</sup> If one squints, the pages also resolve into “gray areas,” as graphic designers refer to the abstraction of the text block, on a white ground. This “*Satzbild*,” or resolution of the text block into an image, and the arbitrary start of new documents, creates dynamic asymmetries across the spread whose disposition evokes an Elementarist composition, and is consistent with the Swiss-style modular grid of the 1960s.<sup>31</sup> While many of the documentary page spreads are purely textual, figures also appear as line art, creating their own rhythms, either by punctuating sections visually, as with the signatures of

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*Gestaltung: Ein Handbuch für Grafiker, Typografen, und Ausstellungsgestalter* (Niederteufen, Switzerland: Verlag Arthur Niggli, 1981).

<sup>30</sup> Kurt Schwitters, for example, prized what he called the “architectonic” [*architektonisch*] quality of some of his typography, such as the blocky lettering on his promotional materials for the Dammerstock Siedlung in Karlsruhe, whose right angles, he believed, melded with the rectangular plane of the page. See Volker Rattemeyer and Dietrich Helms, eds., *Kurt Schwitters: Typographie und Werbegestaltung*, *Typographie kann unter Umständen Kunst sein* (Wiesbaden, Germany: Museum Wiesbaden, 1990), 180–183.

<sup>31</sup> For use of the illustrative term *Satzbild* in English, see Robin Kinross, *Modern Typography: An Essay in Critical History* (London: Hyphen Press, 2004).



particular Bauhäusler, placed to undersign the foregoing document, or promoted to a scale that fills the right two columns. Given the size of the book, many of these images are fully legible as documents—allowing a German text, in its original layout and typography, to be scrutinized comparatively beside its translation, or an annotated English diagram to be read as such.

In the “Illustrations” section that follows, Cooper created numerous constellations of images on the page, grouping, for example, products of the school’s metal workshop differently on successive pages, breaking and following the grid, and forcing the eye to move in each case. While many plates are grid-bound, with their airbrushed orthogonal backgrounds (a point lamented by some critics in the German original), Cooper liberates others as free objects, allowing the curves of a large pitcher against the bare expanse of the page to create a sensuous contrast to the hard-edge geometries surrounding it. Unlike in the German edition, where text and image blocks nest together to create static, fixed compositions that cover the page, Cooper ventilates her layouts with white space, such that one image may be asymmetrically placed alone on the page.

Yet for the many references by critics to Swiss-style graphic design, the book did not show the lapidary precision or even restrained parsimony of more compact Swiss publications. Rather, there is something American in the generous, even audacious scale of this book (its trim size as well as its type size), its relatively freewheeling layout, and the space allocated for some of its plates. Photographic portraits of Bauhaus masters, prints by Paul Klee or Schlemmer, or designs by Bayer occasionally come within an inch of the edge of the page, in many cases overscaled from the original object, and nearly reading as posters. Cooper’s enthusiasm for the subject, and star treatment of its protagonists, is evident in these generous layouts.

The MIT Press publicized the book energetically, and Cooper also created promotional material for it, including a distinctive graphic identity. On fliers distributed by mail, BAUHAUS appeared in Helvetica bold type across nearly the full width of the page, but this time overprinted in a vertical cascade of yellow, orange, and blue, with two hits for each color, creating an oscillating effect that leavened the austerity of the black-and-white book and updated it in a rather psychedelic vernacular (fig. 2.3). The exuberant sales copy running under the heading reads “THE BAUHAUS:/ an idea/ an institution/ and a magnificent new book.”<sup>32</sup> It explains the Bauhaus’s impact on arts pedagogy, and suggests its influence on contemporary art practice (“some of the seminal undertakings of the Bauhaus are just now beginning to bear mature fruit—total theater and kinetic light shows, to name but two”). “And yet for all this,” it continues, “the Bauhaus itself has never until now been thoroughly studied in all its manifestations and successive phases, in its full unity and continuity. This gap in the cultural history of our time has now been amply filled with the publication of a book that encompasses and exhibits the unitary interrelations of all the Bauhaus activities and traces its continuity from the arts-and-crafts movement of the 19<sup>th</sup> century to the happenings of our own present day....” The conclusion, intent on inducing recipients to request copies of the book at a special price, insisted:

There simply is not room enough in this letter to describe or even mention the full range of contents of *The Bauhaus*. Besides, description is not really adequate— the book has to be seen and handled and sampled. Only at first hand does it become apparent that the book’s hefty solidity (about 12 pounds!) is exactly counterpoised by the spaciousness and elegance of its design, a design that is truly worthy of its subject.

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<sup>32</sup> MIT Press mailer, 1969, Cooper Collection, 12-257. This and following quotations in paragraph.

Only with slight hyperbole did the flier close by stating: “Just as the Bauhaus was a movement of the first importance in modern cultural history, so is *The Bauhaus* a publishing event of major importance in the fields of cultural history, art, and education.”

Critics did receive the book as a major cultural event. Reyner Banham welcomed the book for offering the source material to refresh Bauhaus scholarship, which he considered to have been “in a rut, [and] trapped in the Bauhaus myth,” yet he also delivered no shortage of criticism on Wingler’s selection. While Banham took his review as a chance to revisit Gropius’s legacy, he did acknowledge the book’s design, and that it was “stylishly packaged in a slip-cover box that makes it look like a plastic Build-your-own-Bauhaus kit.”<sup>33</sup> This, coming from the prophet of Pop and “clip-on architecture,”<sup>34</sup> was no doubt a compliment.

Most reviewers understood *The Bauhaus* as a source book, “less to be read than read in,” as Martin Jay put it in his review in *Commentary*.<sup>35</sup> Few failed to acknowledge the book’s “massive,” “mammoth,” or “monumental” scale, and some observed that it would be difficult to navigate for those not well acquainted with the school (Lucia Moholy-Nagy made this observation of the original German edition<sup>36</sup>). Some critics found that the design of the book worked to tame its unruly scale, with one writing: “Although this monument to the idea of the Bauhaus weighs 14 pounds, Muriel Cooper’s clean and handsome design keeps it from becoming overwhelming.”<sup>37</sup>

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<sup>33</sup> Reyner Banham, “*The Bauhaus*,” 110.

<sup>34</sup> See Reyner Banham, “A Clip-On Architecture,” ed. Peter Seitz, *Design Quarterly* 63 (1965).

<sup>35</sup> Martin Jay, “*The Bauhaus*, by Hans Wingler” [book review], *Commentary*, March 1970, 82.

<sup>36</sup> Lucia Moholy, “Hans Maria Wingler: *Das Bauhaus*” [book review],” *Du: kulturelle Monatsschrift* 23 (1963): 74.

<sup>37</sup> Robert Saunders, “Review: *The Bauhaus* by Hans M. Wingler,” *Studies in Art Education* 11, no. 3 (April 1, 1970): 71. (In fact, the book weighs closer to 12 pounds.)

Yet not all were so pleased with Cooper's design. Hilton Kramer, writing in *The New York Times*, generally praised the book overall but condemned the design. He concluded: "Whatever one's reservations about the quality of Mr. Wingler's mind, however, his prodigious labors have placed us all in his debt. I wish I could say the same thing for Muriel Cooper, who designed this mammoth volume. Unfortunately, her efforts are more faithful to the letter (sans serif, of course) than the spirit of Bauhaus design."<sup>38</sup> He added: "The book is extremely handsome to look at, but its physical size and weight make it quite unwieldy, and the hundreds of pages of sans serif text are simply dizzying. This is, I think, entirely indefensible in a book clearly intended for scholarly use." Here Kramer wishes both for the book to be smaller, and for the text to be more readable, the kind of prescription that would point backward to the very dense, and hardly more legible, first edition. He continued: "It is also an ironic commentary on the innovation in typographic design which the Bauhaus itself initiated. It reminds us (as if we needed reminding!) that these innovations are now, in many hands, simply mindless conventions." Precisely which conventions Kramer was referring to is unclear, but he does appear to make the assumption, as many have, that these interwar conventions were in actuality based on "functionality" or "legibility" as such. He concluded his review by adding, whether knowingly or not echoing some of the internal discussions about the book: "One can only hope that *The Bauhaus* will very soon be reissued, preferably in two or more volumes, in a more convenient and readable paperback form. For this book is itself one of the essential documents for understanding the modern era."<sup>39</sup>

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<sup>38</sup> Hilton Kramer, "The Bauhaus: Weimar Dessau Chicago" [book review], *New York Times*, September 28, 1969, BR6. This and following quotations in paragraph.

<sup>39</sup> The book would indeed be issued in a scaled-down paperback form in 1978, without color plates, but with a vibrant cover designed by Wendy Richmond and inspired by Cooper's posters publicizing the book. As for

Perhaps the most incisive response to the book, touching on several of the foregoing concerns, appeared in *Progressive Architecture* in 1970. F. Lanier Graham, then Associate Curator in the Department of Architecture and Design at the Museum of Modern Art, echoed some of the trepidations Von Eckardt had shared with Bowen prior to the book's translation. Indeed, Graham identified a kind of identity crisis in the book, suggesting that its purpose was unresolved: "Unfortunately, it falls between the natural reaches of either a popular or a critical audience."<sup>40</sup> As he explained: "Over-all, there is much more in this book than the average interested person would ever care about, and not nearly enough for the serious student." Like others, he suggested instead that two paperback volumes would have been preferable. He then issued this damning conclusion of the book: "It is a monument to an awkward age in the history of disseminating information, and an unfortunate episode in the poundage of publishing." He concluded by appreciating *The Bauhaus* "as a monument to the grandfather of today's schools of architecture," albeit with a major caveat: "One can only wish that it were less of a worshipful object in itself so that every now and again one could wipe off the dust and pick it up off the coffee table."

### *Remediation*

Just as *The Bauhaus* had a long gestation period, and intensive design process, it also had a considerable afterlife. While Cooper would have differed with Lanier's verdict on the book, she might have agreed somewhat with aspects of his review. For her, the monumentality of *The*

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publishing a large work in two volumes, the Press did employ this strategy for Leonardo Benevolo's 1971 *History of Modern Architecture*, a translation from the 1966 Italian original of more than 800 pages.

<sup>40</sup> F. Lanier Graham, "The Bauhaus: Weimar, Dessau, Berlin, Chicago, by Hans Maria Wingler" [book review], *Progressive Architecture* 51 (June 1, 1970): 212. This and following quotations in paragraph.

*Bauhaus* was a virtue. Its unwieldy objecthood was central to its message, and was a case in which Cooper's prerogatives as a graphic designer resulted in a large-scale, perhaps admittedly rather "worshipful" object. Likewise, the idea that it was "a monument to an awkward age in the history of disseminating information" might also have resonated for Cooper, as she sought to restage the book in other ways, and reimagine it in the years to come as a test case for new media. *The Bauhaus* was well-qualified to serve this role for Cooper: it was a proud project for her and for the Press, which had tested the resources of both; and it was indeed a massive, information-rich archive to be parsed. In the years that followed, Cooper would restage *The Bauhaus* in other forms, adopting it as a kind of prototype for her future work.

As part of the book's promotion, Cooper visualized the content of *The Bauhaus* in different ways. Under the same vibrant, color-offset header as the notices announcing the book, she created posters and fliers tiling more than 200 page spreads from it arbitrarily across the surface, creating a simultaneous view of the book's content (fig. 2.4). Reading as a textured field of light-and-dark rectangles from afar, the main characters and objects of the book were legible up-close, reshuffled against its true chronology. Another poster series enlarged several of the book's already sizable plates to giant scale (fig. 2.5). The subjects included the portraits of Gropius and Moholy-Nagy, a Marcel Breuer club chair, and a Wassily Kandinsky painting. At this size, the halftone grain of the images was an element of the composition, resonant with the signature Ben-Day dots of Roy Lichtenstein, and promoting a pop, celebrity status, for the subjects.

Cooper also reimaged the book as a film (fig. 2.6). To do this, she mounted a 16 mm film camera on a copy stand over the book. As she explained: "Later I made a film of the Bauhaus book that sped up the reading process by shooting three frames for each double page, a

view of the information that revealed the conceptual structure of the book as would a stop-motion movie of the construction of a building over time, or of a seed growing into a blossoming flower.”<sup>41</sup> She later showed the film to her students, seemingly as a kind of post-facto proof of concept, demonstrating how much could be grasped at high speed of the book’s structure and even its content. As Cooper explained: “All of my books explored implicit motion. *The Bauhaus* was designed both statically and filmically with a mental model of slow motion animation of the page elements.”<sup>42</sup> Re-presenting a book designed filmically as a film therefore seemed fitting.

With its dance of lighter and darker gray rectangles across the page, balanced by areas of white space, *The Bauhaus* here appears as a kind of abstract film, not unlike the work of an interwar artist like Hans Richter. Commenting on the film, Cooper observed: “This book has a life of its own that I believe is due to an unusually symbiotic relationship of form and content.”<sup>43</sup> In the unedited draft of this interview, she expressed this idea slightly differently: “I feel that given the very same book design with identical page-for-page layout but on a different theme—nobody would have paid any attention to it at all. It is simply a remarkable example of form and content amplifying each other.”<sup>44</sup> This comment applies both to the book’s layout, with its orthogonal juxtapositions echoing the geometry of the objects shown, as well as to the film’s dynamism.

Two anachronistic, rather uncanny impressions, might appear when viewing the film today, in light of Cooper’s later work in software. One is that the blocky columns of text appear

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<sup>41</sup> Heller, 98.

<sup>42</sup> *Ibid.*, 97–98.

<sup>43</sup> *Ibid.*, 98.

<sup>44</sup> Muriel Cooper and Steven Heller, unedited interview transcript, January 6, 1989. Cooper Papers, 12-242.

to “scroll” down the page in the rapid-fire movement of the film, a striking dynamic given Cooper’s later work in developing on-screen reading experiences that borrowed from the metaphor of the printed book. The other impression, in keeping with her reference to stop-motion film, is that the book comes together rapidly and without hands, as if to demonstrate the artificial intelligence software whose development she would soon supervise toward automating page layout. The speed of the film itself is closer to “scanning” than “reading,” in keeping with Moholy-Nagy’s notions of visual literature, or Johannes Molzahn’s idea of *Buchkinema* [book-cinema].<sup>45</sup> It likewise seems to resonate with Moholy’s sense of “vision in motion,” that is, “simultaneous grasp... [which] instantaneously integrates and transmutes single elements into a coherent whole.” Indeed, Cooper’s film of the Bauhaus book answered Moholy’s call for “seeing everything in relationship.”<sup>46</sup>

Cooper visualized *The Bauhaus* in other ways too. For the exhibition *Books 2000*, staged in MIT’s Compton Gallery in 1979, and organized to mark the 2,000<sup>th</sup> title to be published by the Press, Cooper (or her staff, the designer of the exhibition is unclear) exhibited *The Bauhaus* manuscript as two enormous stacks of paper, tied up with string (fig. 2.7). This show of excess, of a massive quantity of data to be disciplined, filtered, and visualized by the labor of the designer, points toward a property of the book that seems to have made *The Bauhaus* especially attractive for Cooper’s various restagings, namely its sheer scale, its massiveness as a data set. Designing systems to manage large and rapidly changing quantities of data would consume

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<sup>45</sup> On the first, see Pepper Stetler, “‘The New Visual Literature’: László Moholy-Nagy’s *Painting, Photography, Film*,” *Grey Room*, no. 32 (July 1, 2008): 88–113.

<sup>46</sup> Moholy-Nagy, *Vision in Motion*, 12 and 68.



Cooper's later career; in *The Bauhaus* she had found a worthy subject onto which these interests could be projected.

Even in 1989, twenty years after its publication, Cooper was still thinking of *The Bauhaus* as a test case for her current work. In that year, she speculated that “Hypertext and hypermedia principles would extend the editing and authorship of... an archival database so that a reader interested particularly in the political and social influences of the Bauhaus would be able directly to pursue multimedia bibliographic information in depth, rather than referencing footnotes and other sources.”<sup>47</sup> In this description, Cooper at once complicates traditional notions of authorship, suggesting the crowd-sourcing of a resource like Wikipedia; imagines a non-linear way through information via hyperlinking; and sees the electronic book as including a plethora of dynamic media. By that time, Cooper was working at the MIT Media Lab, which she liked to describe as “a pioneering interdisciplinary center that is a response to the information revolution, much as the Bauhaus was a response to the industrial revolution.”<sup>48</sup> For the Lab's techno-utopian aims and putative humanism, its dual emphases on research and making, its interdisciplinary composition and commercial sponsorships, and its iterative approach and aestheticizing impulses, the comparison is not—as this dissertation's final chapter describes—altogether unreasonable.

Of course, most projects were not nearly as involved as *The Bauhaus*. In many cases, especially early on, the body of the books was often typeset elsewhere, or merely photomechanically reproduced, and wrapped in the modern graphics of Cooper's program. Cover designs were sometimes executed by Cooper, often by her staff, and more often still,

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<sup>47</sup> Heller, 99.

<sup>48</sup> Muriel Cooper, “Computers and Design,” *Design Quarterly*, no. 142 (1989): 18.

given the quantity of Press publications, outsourced to local designers. One of the major vendors for this work was the Boston-based firm Omnigraphics, headed by Allan Davis, who designed many covers for the Press.<sup>49</sup> While working for Omnigraphics in her mid-twenties, Katherine McCoy—who would go on to a successful career as a graphic designer, and become the co-chair of Cranbrook’s graphic design program in 1971—designed a few covers for the Press.<sup>50</sup>

As just one example of the countless Press titles of the period, Alan Oppenheim’s *Papers on Digital Signal Processing* was no more than a photomechanically reproduced MIT course reader, comprised of typographically heterogeneous academic papers (fig. 2.8). But for its striking cover, the title and author are set in Helvetica bold and regular weights, respectively, at the bottom of two columns; aligned in the middle, on white ground, are two stacked circles, one solid black the other outlined, the pair visualizing a binary relationship in the most economical possible terms. This graphic vocabulary was evident in American hard edge abstraction of the period and in Swiss Concrete Art and typography, and it of course extended back to Suprematism.<sup>51</sup> For American academic publishing however, it was extremely distinctive.

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<sup>49</sup> Davis, who studied at the Rhode Island School of Design, honed his typography skills at the CIBA (Geigy) corporation and IBM, before founding Omnigraphics in 1968. (Omnigraphics corporate literature, n.d., courtesy of Thomas Briggs, partner at Omnigraphics, and currently Assistant Professor of graphic design at the Massachusetts College of Art and Design. Davis had previously worked with James Vogelmann, a founder of Unimark International, and Jack Marmaras, a designer for Ciba Geigy. Both organizations were then at the forefront of international-style typography in America. Dietmar Winkler, email to author, November 27, 2017. On Unimark and Geigy, respectively, see Jan Conradi, *Unimark International: The Design of Business and the Business of Design* (Baden: Lars Müller, 2010). Andres Janser and Barbara Junod, eds., *Corporate Diversity: Swiss Graphic Design and Advertising by Geigy, 1940–1970* (Baden: Lars Müller, 2009).

<sup>50</sup> Katherine McCoy, interview by author, telephone, August 19, 2013. McCoy’s most recognizable covers for the Press include a peacock-eye pattern on silver foil for Samuel Bing, *Artistic America, Tiffany Glass, and Art Nouveau* (Cambridge, MA: MIT Press, 1970). And, in a motif that would recur in some of her later, postmodern work, McCoy used a yellow, axonometric projection of a classical entablature for John Summerson, *The Classical Language of Architecture* (Cambridge, MA: MIT Press, 1966). Both covers feature a restrained use of color, abstract geometry, ample clear-space, and—apt to their historical subject matter—centered and serified typography.

<sup>51</sup> A prominent example in Swiss design, with which Cooper would have been familiar, was Fridolin Müller’s 1963 poster for the “Eidgenössische Schützenfest” celebration in Zurich. The event, which included a riflery competition, was represented by a large black circle on a white ground—a bullseye. The ur-example here is Malevich’s off-

While Cooper's design program at first only affected book covers, it soon spread to their interiors as well. In addition to specifying typography, she pushed to have the body copy of Press books set ragged right, a more modernist convention than the justified blocks of type that had been the standard. Cooper initially encountered opposition to this, but argued for it on both aesthetic and economic grounds: not only would word spacing appear less awkward this way, but setting and correcting type would be easier and thus cheaper.<sup>52</sup>

### **Local Network**

The MIT Press served as a nexus for diverse intellectual strands across MIT, as many of its titles came from Institute faculty, and some of these relationships proved generative. In 1967, Cooper audited a summer course in computer aided design and programming in the Department of Mechanical Engineering with Nicholas Negrojonte, a young professor and recent graduate of the School of Architecture. Cooper never learned to code, in this or subsequent classes, but the potential of computing for design was immediately clear to her. She also formed a friendship with Negrojonte, who soon helped her to install computers in the MIT Press offices and undergraduate research students to operate them. Early forays into computing at the Press involved both tracking project workflow and preliminary attempts at developing page layout software, later imbued with some rules-based artificial intelligence.

In 1968, Negrojonte co-founded the Architecture Machine Group to research the role of computers in the design process. Its particular contribution, however, would be to develop the

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center *Black Circle* of 1915; closer to home, painters like Ellsworth Kelly and Ralph Coburn would explore these geometries again in the 1950s.

<sup>52</sup> P.D.D., "Muriel Cooper," 38.

human-computer interface, modes of input, and visualization of graphics on screen. The working assumptions and aims of the Architecture Machine Group were articulated in Negroponte's first book for the Press, *The Architecture Machine*, of 1970 (fig. 2.9). Here he argues that designers and their computers should relate not as master and slave, but instead collaborate with, and learn from, one another, in the model of the "man-computer symbiosis" earlier proposed by MIT computer scientist J.C.R. Licklider.<sup>53</sup> Computers must also "understand" their users' intentions, as expressed in multiple modes of input, an ambition that foregrounded not just artificial intelligence, but also the importance of the computer interface, and "user friendliness," as such. Indeed, the book is dedicated "To the first machine that can appreciate the gesture."<sup>54</sup>

Cooper and Negroponte collaborated on the book's design. The cover of the square format book features a four-by-four grid of foil stamped squares, which correspond to the modular typographic grid inside, and bear the book's name and author disposed unevenly between them. The squares resemble the silver cubes of the installation *SEEK*, which was the Architecture Machine Group's contribution to the 1970 exhibition at the Jewish Museum in New York, curated by Jack Burnham, and titled *Software: Information Technology: Its New Meaning*

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<sup>53</sup> J.C.R. Licklider, "Man-Computer Symbiosis," *Transactions on Human Factors in Electronics* HFE-1 (March 1960): 4–11.

<sup>54</sup> Nicholas Negroponte, *The Architecture Machine: Toward a More Human Environment* (Cambridge, MA: MIT Press, 1970). Negroponte's follow-up book, *Soft Architecture Machines*, of 1975, revised and extended some of the argument of the earlier one, in addition to echoing its format and reversing out the graphics of its cover.

for Art.<sup>55</sup> Here live gerbils moved metal blocks and a computerized system would attempt to accommodate and adapt to their design intentions accordingly.<sup>56</sup>

It was through the Press that Cooper met other pioneers of artificial intelligence at MIT.<sup>57</sup> She designed *Perceptrons: An Introduction to Computational Geometry*, of 1969, for mathematicians Marvin Minsky and Seymour Papert—a text on artificial neural networks, or computational processes that mimic the animal nervous system (fig. 2.10).<sup>58</sup> Her cover design, in a clashing palette of red and pink, is a demonstration of human perceptual constraints referred to in the book. Cooper, Minsky, Papert, and Negroponte became close friends, and a decade later they would serve as founding faculty in the MIT Media Lab. Their interests in artificial intelligence had different valences—Papert, for example, was concerned with early childhood education; Negroponte with architecture; Cooper with graphic design—but these interests all converged, in one way or another, on the human-computer interface.

## Designing Processes

More than designing individual titles, Cooper designed processes at the MIT Press. Some 500 books appeared during her tenure there, and naturally most were not by her hand. As she once

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<sup>55</sup> Jack Burnham, ed., *Software: Information Technology: Its New Meaning for Art* (New York: The Jewish Museum, 1970). *Software* was one of three seminal exhibitions to appear within a year of one another on related material. The other two also produced publications: Jasia Reichardt, ed., *Cybernetic Serendipity: The Computer and the Arts*, Institute of Contemporary Arts, London (New York: Praeger, 1969). Kynaston McShine, ed., *Information* (New York: Museum of Modern Art, 1970).

<sup>56</sup> For more on SEEK, see Felicity D. Scott, “DISCOURSE, SEEK, INTERACT,” in *Outlaw Territories: Environments of Insecurity/Architectures of Counterinsurgency* (New York: Zone Books, 2016), 339–382.

<sup>57</sup> For a very brief overview of the early history of artificial intelligence, especially at MIT, see Molly Wright Steenson, “What We Know About AI” (AI Now 2017 Experts Workshop, MIT Media Lab, July 10, 2017), <https://www.youtube.com/watch?v=8H0bntBSmFM>.

<sup>58</sup> Marvin Minsky and Seymour Papert, *Perceptrons: An Introduction to Computational Geometry* (Cambridge, MA: MIT Press, 1969).

explained, her aim at the Press was to publish books “without the self-defeating super-star system—that is, without doing everything myself or hiring the biggest names in design to do it all.”<sup>59</sup> Rather, Cooper designed routing and tracking systems at the Press, standardized formats and typography, and increasingly used software to streamline workflow— in addition, it must be said, to employing some very talented designers (fig. 2.11). “The bulk of the work was standard and repetitious and required a set of systemic but variable design solutions for limited budgets. Developing systems that would accommodate a wide range of variable elements was very much like designing processes.”<sup>60</sup> This shift, from designing objects to designing processes, represents in microcosm a larger shift within Cooper’s career. In a 1970 memo to the staff of the Press she explained the status of her department’s work, and its ambitions moving forward:

We have evolved some simple but effective methods of analysis of typographical structures and layout relationships which provide us with an expanding base for judgment and decision making. Such data may well be an appropriate base for the beginnings of a computer program for graphic/book design problems. When information can be reliably analyzed and can be effectively accessible and updated we increase our ability to move quickly with quality when necessary as well as to explore in depth problems or projects that concern us.

In setting standards for a “style-book” we are moving not so much towards the old fashioned “house-style” idea or even adapted formats, but towards sets of variables which are regenerative and always in context with the complexities of the book system as well as with the implicit time experience.<sup>61</sup>

Cooper’s mode of systems thinking in publication design was well-timed for the Press, whose list of titles would continue to expand even as its resources would diminish. As an internal report described, by the mid-1970s, the Press published some 100 books each year, retaining its

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<sup>59</sup> Muriel Cooper, quoted in P.D.D., “Muriel Cooper,” 38.

<sup>60</sup> Heller, “Muriel Cooper,” 97.

<sup>61</sup> Muriel Cooper, memo, “July 1, 1970 year past and future concerns,” Cooper Collection, 12-242.

balance between science and the humanities. The market for University Press books had expanded dramatically, with the number of titles soaring nationally from approximately 11,000 in 1950 to 35,000 in 1976. Sales figures expanded accordingly: from 1958 to 1976, American university press sales were estimated to have risen from \$7 million to 53 million, up 650%. While presses like MIT's were well-funded in the "post-Sputnik 1960s," as the report put it, the 1970s would see lower enrollments, rising academic unemployment, and shrinking budgets.<sup>62</sup> The more efficient processes Cooper introduced at the Press helped it to economize and thrive as other presses saw major losses.

The variables that formed the Press "style book" did give MIT books a distinctive look (fig. 2.12). Whether in the hard sciences, social sciences, or art history, MIT Press titles often featured a two- or three-column grid on the cover, Helvetica type, either an abstract geometric graphic or an illustration, and ample negative space. The typography inside was usually more traditional than that on the cover, often rendered in a humanist, old-style serified face like Palatino (generally considered more legible than a sans serif). Cooper's system worked by allowing the Press, in her words, "to move quickly with quality when necessary as well as to explore in depth problems or projects that concern us."<sup>63</sup> One of these in-depth projects proved to be the most contentious Cooper would work on at the Press, simultaneously revealing both her talent as a designer as well as her frustrations about the medium of print and the role of the service provider.

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<sup>62</sup> This assessment of university presses, including market figures, comes from an MIT Press draft document offering a capsule history of academic publishing, likely by Roger Conover, and probably dating to 1978. Visible Language Workshop, Records of Muriel Cooper, Institute Archives and Special Collections, Massachusetts Institute of Technology, AC 287, box 21.

<sup>63</sup> Ibid.

## *Learning from Las Vegas*

Similar in size to *The Bauhaus*, but diametric in its polemic, *Learning from Las Vegas* was, for its authors, nevertheless tainted by its predecessor. The book, authored by Robert Venturi, Denise Scott Brown, and Steven Izenour, was published to great fanfare in 1972 (fig. 2.13). While the revised and fully redesigned paperback edition of 1977—*Learning from Las Vegas: The Forgotten Symbolism of Architectural Form*—remains in print, and is required reading in many surveys of 20<sup>th</sup> century architecture, the 1972 first edition long remained prized by design aficionados, but mostly out of reach for the general public. (This finally changed in 2017, when the MIT Press issued a facsimile edition of the book, long in planning.<sup>64</sup>) As Executive Editor Roger Conover wrote of the original book in a “Publisher’s Note” that introduces the facsimile edition: “Two thousand copies were printed; two thousand copies disappeared.”<sup>65</sup>

Cooper was quite proud of *Las Vegas*. As with other of her flagship projects, it is an example of a fortuitous synergy between the authors’ substantive ambitions and Cooper’s own design interests. While the authors of *Las Vegas* found Cooper’s involvement in the design conception of the book to have unduly infringed on their authorial territory of meaning-making—and their aesthetic prerogative, as designers in another field—it was in fact an exemplary assignment for Cooper, and one in which her involvement qualified her as at once author, editor, and producer. The significance of *Learning from Las Vegas* for design history is thus manifold: it was both a monumentally important book in the history of architecture and planning and also a tour de force for Cooper in terms of its design.

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<sup>64</sup> The list price for the 2017 facsimile edition is \$100. While still expensive, it is roughly a tenth the price of a first edition in good condition.

<sup>65</sup> Robert Venturi, Denise Scott Brown, and Steven Izenour, *Learning from Las Vegas* [1972], facsimile edition (Cambridge, MA: MIT Press, 2017).



Much has been written in the past 15 years on the design, redesign, and legacy of *Las Vegas*. These accounts have focused primarily on the book's authors and its argument, from an architectural, urbanistic, and to some degree media-theoretical perspective, yet they have also engaged productively with the book's design. To the extent that Cooper has appeared in scholarly literature, it is in the context of her work on this book. The research around Cooper's involvement, and the discussions of her design, are both sensitive in these projects, yet her biographical background and work on other projects is relegated primarily to footnotes. These recent accounts are indispensable in understanding *Las Vegas*, and rather than broadly summarizing them here, only their most salient points are raised in the service of a focused analysis of Cooper's contribution.

The most relevant of these accounts come from three authors in particular. The most extensive is Aron Vinegar's 2008 book *I Am a Monument: On Learning from Las Vegas* (MIT Press), whose fifth and final chapter discusses the book's design and redesign in a manner indebted to literary theory and in particular the emergent discourses of postmodernism in which the book's authors were engaged. This was followed by Vinegar and Michael Golec's 2009 edited volume *Relearning from Las Vegas* (University of Minnesota Press),<sup>66</sup> which developed from a Fall 2003 special issue of the journal *Visible Language*, edited by Vinegar and Golec, and dedicated to *Learning from Las Vegas*. Of particular interest is the book's second chapter, a sensitive analysis by Golec titled "Format and Layout in Learning from Las Vegas."<sup>67</sup> Martino Stierli has published vital scholarship on both the Las Vegas Studio and resultant book as well as

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<sup>66</sup> Aron Vinegar and Michael J. Golec, eds., *Relearning from Las Vegas* (Minneapolis: University of Minnesota Press, 2009).

<sup>67</sup> This first appeared in *Visible Language* as: Michael Golec, "Doing it Deadpan: Venturi, Scott Brown and Izenour's *Learning from Las Vegas*," *Visible Language* 37, no. 3 (2003): 266–87.

on Venturi's broader relationship to classicism. Of particular interest is his 2013 book *Las Vegas in the Rearview Mirror: The City in Theory, Photography, and Film*, published by the Getty Research Institute as a translation of his 2010 text in German.<sup>68</sup>

### *The Studio*

*Learning from Las Vegas* emerged from, and was intended to present the results of, a Fall 1968 third-year studio course at the Yale School of Architecture (fig. 2.14). The full title of the studio was "Learning from Las Vegas, or Form Analysis as Design Research," the premise for which had been presented in a March 1968 article in *Architectural Forum* by Venturi and Scott Brown entitled "A Significance for A&P Parking Lots, or Learning from Las Vegas."<sup>69</sup> This article, "augmented by findings," forms the first chapter of the 1972 book.

As the preface to the book describes it, the studio was "a research project" and "a collaboration" among the three authors, nine students in the masters of architecture program, two students in planning, and two graphic design students. The authors explained their itinerary as follows: "We spent three weeks in the library, four days in Los Angeles, and ten days in Las

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<sup>68</sup> The German original, of 2010, is *Las Vegas im Rückspiegel: die Stadt in Theorie, Fotografie und Film* (Gta Verlag). This text emerged from Stierli's 2007 doctoral thesis at ETH Zurich: "Ins Bild gerückt: Ästhetik, Form und Diskurs in der Stadt in Venturi und Scott Browns *Learning from Las Vegas*" [Put into Perspective: Aesthetics, Form, and Discourse of the City in Venturi's and Scott Brown's *Learning from Las Vegas*]. Stierli also co-edited, with Hilar Stadler, the 2008 book of photographic documentation, *Las Vegas Studio: Images from the Archive of Robert Venturi and Denise Scott Brown* (Scheidegger & Spiess). Stierli's 2003 master's thesis at the University of Zurich, with Professor Stanislaus von Moos, was also the basis for the 2011 book-length essay *Venturis Grand Tour* (Standpunkte). See also his published articles on Venturi's relationship to Rome in the *Neue Zürcher Zeitung* and *AA Files*. Martino Stierli, "Das verdrängte Gedächtnis der Postmoderne. Die architekturgeschichtliche Bedeutung von Robert Venturis 'Entdeckung' Roms," *Neue Zürcher Zeitung*, December 13, 2003, 69. Martino Stierli, "In the Academy's Garden: Robert Venturi, the Grand Tour and the Revision of Modern Architecture," *AA Files* 56 (2007), 42–63.

<sup>69</sup> Robert Venturi and Denise Scott Brown, "A Significance for A&P Parking Lots, or Learning from Las Vegas," *Architectural Forum*, March 1968, pp. 37–43.

Vegas. We returned to Yale and spent ten weeks analyzing and presenting our discoveries.”<sup>70</sup>

The quantity of these discoveries was substantial. As Denise Scott Brown reported on the studio following its completion, “we took 5,000 slides and 10,000 feet of film.”<sup>71</sup> She added: “Each research topic ended in an attempt to find adequate graphic means to communicate new kinds of urban information not easily represented by orthographic projection or land use maps.”

Designing this enormous quantity of information into a digestible result was therefore central to the studio, as evidenced by the designer Steven Izenour’s role in helping visualize the project and the presence of two graphics students. Nevertheless, the book’s preface concludes:

There is still a wealth of architectural information to be culled from Las Vegas. In addition, some of the emphases that were important to the studio we have not stressed in this book; for example, our pedagogical interest in evolving the traditional architectural “studio” into a new tool for teaching architecture and our particular interest in finding graphic means, more suitable than those now used by architects and planners, to describe “urban sprawl” urbanism and particularly the commercial strip.<sup>72</sup>

The authors’ studio proposal and book, and Cooper’s design for it, were both laden with iconoclasm, albeit apparently not of a compatible sort. *Learning from Las Vegas* declared, at the outset, that “Learning from the existing landscape is a way of being revolutionary for an architect,” and indeed “a more tolerant way” of doing so than destroying a city and starting again, as Le Corbusier famously proposed for Paris. Rather, this project was intended “to question how we look at things,” and the Vegas Strip “challenges the architect to take a positive, non-chip-on-the-shoulder view.”<sup>73</sup> The Strip was posited here as an essential, modern-day

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<sup>70</sup> Robert Venturi, Denise Scott Brown, and Steven Izenour, *Learning from Las Vegas* (Cambridge, MA: MIT Press, 1972), ix.

<sup>71</sup> Denise Scott Brown, “The ‘Learning from Las Vegas’ Studio, Fall 1968, or Formal Analysis as Applied Design Research.” July 1969, p. 2. The Architectural Archives, University of Pennsylvania.

<sup>72</sup> Venturi, Scott Brown, and Izenour, ix.

<sup>73</sup> *Ibid.*, 1.

archetype worthy of study, a typology for automobile culture as important as the piazza was in Renaissance Italy. Visiting Vegas was to be a kind of Grand Tour for these architecture students, an antidote to reflexive, unthinking modernist tropes, and a way to study two phenomena in particular: urban sprawl, in the auto-city of the present; and symbolism, against the modernist's preoccupation with space as architecture's essential focus and primary material. Studying Vegas—a more manageable stand-in, as Stierli points out, for Los Angeles—was to take a new kind of vernacular seriously.<sup>74</sup> Architects, the authors note at the start of the book, seem eager to adopt the lessons of certain vernaculars—“architecture without architects,” a reference to Bernard Rudofsky's seminal 1964 exhibition and publication of that name<sup>75</sup>—but turn up their noses at contemporary urban vernacular.

The aesthetic populism of Pop art, they propose, could instead serve as a model. The authors write: “For the artist, creating the new may mean choosing the old or the existing. Pop artists have learned this.”<sup>76</sup> On the LA leg of their trip, the group visited Pop artist Ed Ruscha, who inspired one of their modes of representing the city: *Las Vegas* included a montage of street views, shot from a camera mounted on the hood of a car, and pasted together somewhat more crudely than Ruscha's 1966 accordion-style art book *Every Building on the Sunset Strip*,<sup>77</sup> but identified in the caption as “An Edward Ruscha Elevation of the Strip.”<sup>78</sup> For the authors, the as-

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<sup>74</sup> *Learning from Las Vegas* is really about Los Angeles, Stierli explains; it is “a simplified version.” Stierli, *Las Vegas in the Rearview Mirror*, 11.

<sup>75</sup> See Bernard Rudofsky, *Architecture Without Architects, an Introduction to Nonpedigreed Architecture* (New York: Museum of Modern Art, 1964).

<sup>76</sup> Venturi, Scott Brown, and Izenour, 2.

<sup>77</sup> Edward Ruscha, *Every Building on the Sunset Strip* (Los Angeles: s.n., 1966).

<sup>78</sup> *Ibid.*, 26–9.

found operations of Pop art could inspire a research paradigm for architecture. In a post-mortem report on the studio, Scott Brown listed a number of useful lessons from it:

The value of research and analysis in architecture, of learning from what ‘is’ before proclaiming what ‘ought to be,’ and of investigating open-mindedly an environment disdained by the taste-makers; the admission that architects are concerned with form and that this does not preclude social concern but rather is a necessary ingredient in a professional offering toward social action; the admission that analysis of form is a worthy aspect of architectural research: these are all propositions finding currency in architecture again today.<sup>79</sup>

### *The Book*

Cooper’s design for the 1972 book was, in its monumental format (14” x 10.5”), large enough to evoke a geographic atlas, and within a quarter inch in height and width of the Bauhaus book. As the authors describe its tripartite structure, “The first part of this book is a description of our study of the architecture of the commercial strip. Part II is a generalization on symbolism in architecture and the iconography of urban sprawl. Part III describes the work of Venturi and Rauch from 1965 to mid–1971.”<sup>80</sup> Cooper used a flexible five column grid to accommodate the diverse range of visual and verbal elements, including photographs, photomontages, maps, large diagrams, and hand-drawn illustrations. She also created a novel sequential grid system, whereby the first section of the book had one column of text, the second part two, and the third part three. According to her, the book

was an exercise in using design to resonate content with subject. The visual materials were not only graphically rich, but as content-laden as the text, so the interdependent rhythms of those relationships were important. I wanted to arrange visual and verbal materials spatially in a nonlinear way to enhance the reader’s comprehension. Creating virtual time and space in two dimensions has always intrigued me.<sup>81</sup>

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<sup>79</sup> Scott Brown, “The ‘Learning from Las Vegas’ Studio,” 3.

<sup>80</sup> Venturi, Scott Brown, and Izenour, i.

<sup>81</sup> Heller, “Muriel Cooper,” 98.

Layouts for the book, on taped together sheets of gridded paper, show the page spreads as thumbnails in a kind of compositional storyboarding process (fig. 2.15). This schematic representation of the layout indicates images with numbered rectangles and shows abstract columns surrounding. As Vinegar shrewdly observes, “Cooper’s layouts from *Learning from Las Vegas* functioned as a kind of ‘synoptic dummy’ for her, in that they showed how the pages related to each other in terms of rhythm and spacing, without one’s having to flip through the actual pages of the book. Cooper was always interested in this implicit motion in the design of her books, and the mock-ups allowed her to ‘virtually’ explore these issues on a single sheet of paper.”<sup>82</sup> In this, Cooper’s process relates to some of the re-stagings of the Bauhaus book, and perhaps also the process of its design as well.

Cooper typeset *Learning from Las Vegas* on an IBM Composer electric typewriter, and selected as her typeface Univers, a modern sans serif by the Swiss typographer Adrian Frutiger, released in 1957. Controversially, Cooper triple spaced the body copy and ran the book’s “studio notes” beside it in a dense, single-spaced block of bold Univers type. As Scott Brown later complained, “because the pages were big and the texts that accompanied the graphics small, she [Cooper] was forced to string out the lines of written material, making them too long and too widely spaced to read easily.”<sup>83</sup> The body text is peppered with bold figure numbers floating above the lines of text, and into the “skyline,” rather like the signage of the Vegas Strip.<sup>84</sup> A

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<sup>82</sup> Vinegar, 134.

<sup>83</sup> Denise Scott Brown, “Comments on the Design of the First Edition of *Learning from Las Vegas*,” in *Supercrit #2: Learning from Las Vegas*, ed. Kester Rattenbury and Samantha Hardingham (London: Routledge, 2007), 17.

<sup>84</sup> I am indebted to Aron Vinegar for making this comparison, between the figure numbers and “so many signs dotting the side of the road.” Vinegar “see[s] this patterning,” which the authors disliked, “as one of the best instantiations of their own argument about the contrast between the system and order on the Las Vegas Strip, in which the ‘continuous’ and ‘constant rhythm’ of the highway contrasts effectively with the ‘uneven rhythm of signs behind it.” Vinegar, 167.

textured, collage aesthetic, incorporating different kinds of material by different hands (the authors', their students', and other found materials) typifies the work, which exemplifies the kind of non-linear reading experience Cooper sought. This effect is heightened, as Michael Golec has observed, by Cooper's subversion of axial symmetry throughout, as the single columns of bold type set the eye off balance. What Golec aptly calls "Cooper's use of crosscutting elements in the layout"<sup>85</sup> resonates, as he notes, with the text's observation that

A driver 30 years ago could maintain a sense of orientation in space. At the simple crossroad a little sign with an arrow confirmed what he already knew. He knew where he was. Today the crossroad is a cloverleaf. To turn left he must turn right, a contradiction poignantly evoked in print by D'Arcangelo.<sup>86</sup>

The Allan D'Arcangelo work referenced is reproduced at the bottom of the page. The American Pop artist's prints assimilating the bold patterning and symbology of highway signage, improbably combined or interpenetrating in space, was a favorite of the authors. The image they reference, *The Trip*, shows a bold red arrow, pointing left, inscribed within a square. Within the arrow, a dingbat-style pointing hand faces right. Cooper's task, as she seems to have understood it, was to communicate both orientation and disorientation at the same time, or to orient the reader within a system whose ostensible disorder yielded to a deeper logic. This kind of "complexity and contradiction" in wayfinding, with its correlate in the space of the book, would have been an apt task for Cooper, but nevertheless an impossible one, given the shifting criteria of the authors and their moving signposts for success.<sup>87</sup> Nevertheless, Cooper's persistent interest

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<sup>85</sup> Michael Golec, "Format and Layout in Learning from Las Vegas," in *Relearning from Las Vegas*, ed. Aron Vinegar and Michael Golec (Minneapolis: University of Minnesota Press, 2009), 39.

<sup>86</sup> Venturi, Scott Brown, and Izenour, 4.

<sup>87</sup> See Robert Venturi, *Complexity and Contradiction in Architecture* (New York: Museum of Modern Art, 1966). Graphic complexity and non-linearity, as opposed to modernism's simplicity and hierarchy, was also valorized during this time for its political valences. As graphic designer and feminist Sheila de Bretteville wrote in 1973: "When visual material is ambiguous the different nuances often encourage multiple and alternative reactions to the same communication. Were the mass media to include contradictions; were its images to contain suggestions rather than statements, the viewer could make an effort to bridge the gap, to interpolate, extrapolate, participate. But

in dynamism and simultaneity in her work would seem compatible with the authors' own interest in overcoming the generally rigid nature of architectural representation which was, as they wrote, "static where it [the Las Vegas Strip] is dynamic, contained where it is open, two-dimensional where it is three dimensional."<sup>88</sup>

### *The Conflict*

Cooper thought she had fully entered the spirit of the book, only to find that she was apparently on a different page than the authors. Channeling the glitzy atmosphere of the Vegas Strip, for example, she proposed a bubble wrap dust jacket with fluorescent pink polka dots underneath. This proved to be one of the most irritating suggestions for the authors, and went to the heart of what they saw as a philosophical conflict between their argument in the book and Cooper's approach. In February of 1972, they wrote to Michael Connelly, their editor at the Press:

The cover as designed is absolutely unacceptable: leaving out questions of good or bad design, it is inappropriate. It is against the philosophy of the book; it is a duck—"heroic and original"—almost fruity in its appearance. This is a serious study with a serious text and deserves a dignified conventional image. The shock must come from the contents inside the book.... We have shown Muriel what we mean in the sketches.<sup>89</sup>

The reference to a "duck" gets to one of the most famous pairs of definitions set out in the book, namely between the "duck" and the "decorated shed" (fig. 2.16). Here the former represents a building "where the architectural systems of space, structure, and program are submerged and

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this is not the goal of mass media communication." Sheila Levrant de Bretteville, "Some Aspects of Design from the Perspective of a Woman Designer," in *Women in Graphic Design = Frauen und Grafik-Design: 1890–2012*, ed. Gerda Breuer and Julia Meer (Berlin: Jovis Verlag, 2012), 311. Originally published in *Icographic: A Quarterly Review of International Visual Communication Design*, no. 6 (1973), 1–11. (Indeed, de Bretteville alludes here in positive terms to "complexity and contradiction," and an engagement with popular vernacular, provided that they do not ossify into a style or fashion.)

<sup>88</sup> Ibid., 15.

<sup>89</sup> Robert Venturi to Michael Connelly, February 11, 1972. Quoted in Vinegar, 121.



distorted by an overall symbolic form.”<sup>90</sup> The authors explain that “this kind of building-becoming-sculpture we call the *duck* in honor of the duck-shaped drive-in, ‘The Long Island Duckling,’ illustrated in *God’s Own Junkyard* by Peter Blake.” The latter term, “decorated shed,” applies “where systems of space and structure are directly at the service of program, and ornament is applied independently of them.”<sup>91</sup> These two terms represent the bad and good objects in the authors’ account, respectively, and they likewise map to a distinction between the “heroic and original” and the “ugly and ordinary.”<sup>92</sup> For the authors, then, Cooper had distorted the book, outside and in, in the service of a heroic originality which they at times ascribe to a tired set of modernist principles and at other times to Cooper’s own strivings toward distinctive form. They suggest, instead, that they wished the book to be “ugly and ordinary.” Yet it seems Cooper agreed that it was “a duck” that she had given them, but also believed that it was a duck that they had asked for: “What they wanted most was a Duck, not a Decorated Shed. I gave them a Duck.”<sup>93</sup>

The outward appearance of the book, as it was released in 1972, represents a compromise position between the warring parties. The authors got their “ordinary” image on the cover, with the title massive and centered, its all-caps, serified Baskerville type stamped in gold foil. The title is surmounted by an image from their research, of the bronzed Tanya tanning oil model on a roadside billboard, with cars whizzing into the foreground and a forest of casino, motel, and restaurant signage in the background. The Roman typography befits the “serious study” and

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<sup>90</sup> Venturi, Scott Brown, and Izenour, 64.

<sup>91</sup> Ibid.

<sup>92</sup> Ibid., 93.

<sup>93</sup> Janet Abrams, “Muriel Cooper’s Visible Wisdom,” *I.D. Magazine*, September/October 1994, 97.

“serious text” of the book, and lends it a “dignified” image, though the juxtaposition of the text and image, high and low, brim with the Pop irony the authors relished. This particular constellation of image and text also recalls the montage practice of Le Corbusier on various of his publications, but in particular on the cover of *Vers une Architecture* of 1923 (fig. 2.17). (The resemblance is only heightened in the revised edition of *Las Vegas*, with its light blue cover.<sup>94</sup>)

The compromise position for Cooper was that she could wrap this cover with a glassine dust jacket that superimposed the book’s table of contents as sans serif, running type, the title picked out in red, and the text interrupted only to reveal the Tanya photograph underneath. As Vinegar notes, “this dust jacket does not really express anything. It surely does not express its contents as interior depth; rather, it literally ex-presses—stamps or extrudes the section headings as another surface.”<sup>95</sup> The visual effect reflected a persistent interest in transparency and superimposition on Cooper’s part, allowing for two simultaneous views on the material, and a surfacing of the book’s content(s). Vinegar also notes resonances here with Cooper’s cover for the 1964 booklet *Communication by Design*, in which a title emerges from a more or less continuous surface of text.<sup>96</sup> However, in 1964, this treatment was a kind of visual puzzle of signal and noise; in 1972, Cooper presented two distinct but simultaneously legible layers of meaning, also from two different authors. This glassine dustjacket (the first casualty of surviving

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<sup>94</sup> This template, of a centered, all-caps title paired with an outlined photograph, persists through other volumes of Le Corbusier’s “*Collection de L’esprit Nouveau*.” “In the case of titles like *L’art décoratif d’aujourd’hui* and *La Peinture moderne* (both 1925), the typography is also serified (specifically the late 18th century, neoclassical typeface Didot). See Catherine de Smet, *Le Corbusier: Architect of Books* (Baden: Lars Müller, 2005). For a discussion of Le Corbusier’s montage practice, and influence from other avant-garde periodicals, see Jean-Louis Cohen’s introduction to Le Corbusier, *Toward an Architecture* (Santa Monica: Getty Research Institute, 2007).

<sup>95</sup> Vinegar, 121.

<sup>96</sup> *Ibid.*, 122.

first editions) was apparently not quite as objectionable to the authors as other aspects of the design. Yet Cooper got her way with the layout of the book.

The crux of the authors' objections to the design is most visible in two artefacts. The first is an annotated copy of the 1972 edition, marked up with their feedback and the responses of the MIT Press design team, namely Cooper and staff designer Sylvia Steiner (though the comments appear mostly to be in Cooper's hand) (fig. 2.18).<sup>97</sup> The intention was that a future, revised edition would integrate the authors' comments, as is evident from the first annotation, of the colophon, with an arrow pointing to the date of publication and the instruction "change c/r" [copyright]. The real conflict begins on the title page. The book's title, left justified in the top left corner, and rendered triple spaced on two lines, with a ragged right edge, is circled in red pencil, with a line connecting it to a centered and handwritten title in the middle of the page. The annotation by Scott Brown asks: "Could this page be revised because its composition is like a duck?" At the end of Venturi's preface, an inscription by him in purple ink reads "we very very much appreciate your understanding and patience, Roger Conover 2/8/03." Below that, Scott Brown adds "Me too," along with her name.<sup>98</sup> That patience and understanding must have been necessary to bring out the book, and the revised edition that followed it, is evident from the number and nature of the authors' edits. Similar feedback to the title page appears on a section heading page: "Part I: A Significance for A&P Parking Lots, or Learning from Las Vegas." An arrow here suggests that this block of type be moved to the center, accompanied by the word "Please" beside it; the crisp answer below, in Cooper's hand, reads "NO." The same call and

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<sup>97</sup> The book is held in the Classics collection of the Avery Architectural and Fine Arts Library at Columbia University. According to Vinegar, it was given by Cooper to MIT Press editor Roger Conover, later inscribed by Venturi and Scott Brown, and then given to Avery library with accompanying documents. See Vinegar, f.n. 17, 217. The book is designated as Avery Classics Cage copy, AA735 L47 V56 F.

<sup>98</sup> *Ibid.*, xiii. Emphasis in the original.

response plays out in the chapter page for the second section, “Part II: Ugly and Ordinary Architecture, or the Decorated Shed.” Here the request makes clear that the type should be center aligned by indenting the second line. The answer in this case, perhaps showing Cooper’s mounting frustration as she reviewed the growing number of comments, adds an emphatic exclamation point to her two-letter response in the negative.

Another of Scott Brown’s stated concerns was with the legibility and the quality of reproductions. She often argued that more of the page real estate could be used to make information-rich images and diagrams clearer. For example, where a diagram of the Vegas Strip extends across a two-page spread (pp. 20–21), Scott Brown has marked “poor reproduction.” Garbage in, garbage out, Cooper seems to suggest, replying: “Hopeless without new art.” In another case (p. 121), the critique reads “illegible illustrations.” Sassily, Cooper agrees, simply writing “True.” Referring to the two page spreads that presented the authors’ “Edward Ruscha Elevation,” the comment reads: “If these could stretch to the edges of the pages their detail would be visible.” Again, the response is “NO.”

Scott Brown believed Cooper was sacrificing legibility in favor of a modernist precept, which she deemed the “white-page aesthetic.”<sup>99</sup> Even in 2014, she explained: “In general, content was manhandled by the modish but inappropriate template for the sake of graphic design. Our Strip photos are as detailed as Canaletto paintings and could have been laid out well on the big pages, but a tyranny of white paper reduced many to postage stamp size.”<sup>100</sup> Modish or not, and mishandled or not, it is true that Cooper’s aesthetic, and modernist graphic design generally,

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<sup>99</sup> Quoted in Vinegar, 139.

<sup>100</sup> Denise Scott Brown, “Still Learning from Denise Scott Brown: 45 Years of *Learning from Las Vegas*,” interview by Stephanie Salomen and Steve Kroeter, January 7, 2014, n.p., <http://www.designersandbooks.com/blog/still-learning-from-denise-scott-brown>.

considered the unprinted page as a positive element.<sup>101</sup> In her July 1972 letter to Connelly, Scott Brown complained that “The ‘Swiss-style’ graphic design remains a disappointment to us.”<sup>102</sup>

Reductive but not wrong, this association between Cooper and Swiss-style graphic design was in any case more accurate than the diagnosis offered in the searing preface to the revised edition of the book, whose redesigned form was itself a thoroughgoing repudiation of Cooper’s work.

### *The Revision*

The revised edition of *Learning from Las Vegas*, bearing the subtitle *The Forgotten Symbolism of Architectural Form*, appeared in 1977 (fig. 2.19). It remains in print today, now past its 20<sup>th</sup> printing. The softcover book measures 8 <sup>15/16</sup>” x 6”, its cover is light blue, and the words “Revised Edition” appear centered below the title. Scott Brown later explained that, as compensation for Cooper’s design of the book: “we were able to reject Muriel’s cover (which included bubble wrap as a motif) and to design one of our own. Its typeface, color, and inset picture (based on cigarette-card albums of my childhood) and its deadpan axial arrangement, simulating a scholarly tome, were intended to play against its outrageous content, as part of a game of melding pop culture, high culture and high jinx—our kind, not Muriel’s.”<sup>103</sup>

The visual similarities with the first edition effectively end with the cover, as the interior of the book was entirely redesigned. “This new edition of *Learning from Las Vegas*,” Scott

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<sup>101</sup> Jan Tschichold argues for this in *Jan Tschichold, The New Typography: A Handbook for Modern Designers* [1928], trans. Ruari McLean (Berkeley: University of California Press, 1995). Kurt Schwitters writes in his “Theses on Typography,” of 1924: “The text-negative parts—the unprinted spaces of the printed page—are also typographically positive values. Quoted in translation in *Kurt Schwitters: Avant-Garde and Advertising* (Madrid: Fundación Juan March, 2014), 24.

<sup>102</sup> Denise Venturi [sic] to Michael Connelly, July 25, 1972, p. 4. Avery Architectural and Fine Arts Library, documentation accompanying annotated edition.

<sup>103</sup> Scott Brown, “Comments” 18.

Brown explains in the “Preface to the revised edition,” “arose from the displeasure expressed by students and others at the price of the original version.”<sup>104</sup> Arguing that a second printing of the original version would be “almost twice the price,” she explains the reason to abridge the book, “and to add a little,” to make it more accessible. The omissions are of the third section, of the firm’s work, and “about one-third of the illustrations, including almost all in color and those in black and white that could not be reduced to fit a smaller page size.” The intention was to cut costs, but also, as Scott Brown says, “to shift the book’s emphasis from illustrations to text...” This it certainly does, as pages of single-column, justified, and serified type (Baskerville) under clear headings alternate with pages of images whose role is clearly secondary, and thus relegated to “illustrations.”

As a model to emulate, Vinegar explains, Scott Brown sent the Press copies of pages from a 1941 Italian touring book, whose staid style she found more befitting of a serious study.<sup>105</sup> Scott Brown describes the first two sections of the revised edition as “stripped and newly clothed,” so that they “should appear more clearly what we intended them to be: a treatise on symbolism in architecture.” In sum, she says, the aim of the redesign was to “‘de-sex’ the text.”<sup>106</sup> Vegas, Scott later implied, should be the source of the sexiness, not the book’s design: “All the Las Vegas analytic graphics were designed by us—the authors of LLV and the students of the studio. To me, these illustrations, not the book’s design, are the major conveyors of LLV’s excitement.”<sup>107</sup> In resisting Cooper’s “heroic” approach, she explains, they had argued at the time

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<sup>104</sup> Denise Scott Brown, “Preface to the Revised Edition,” in Venturi, Scott Brown, and Izenour, *Learning from Las Vegas: The Forgotten Symbolism of Architectural Form*, xv. This and following quotations in paragraph.

<sup>105</sup> Vinegar, 167–8.

<sup>106</sup> Denise Scott Brown, “Preface,” v.

<sup>107</sup> Scott Brown, “Comments” 17. This and following quotation.

that “the Las Vegas material was itself so strong that it would upstage any efforts at graphic glitz, and asked that [they] not compete with the city in that way. But to no avail.” The prospect of both the book’s form and its contents creating visual excitement, in parallel, and even synergistically, was not one Scott Brown could countenance.

Yet the final clause of Scott Brown’s comment on shifting the emphasis from image to text contained an important indictment, namely the hope that the changes in format would “remove the conflict between our critique of Bauhaus design and the latter-day Bauhaus design of the book.” She added: “the ‘interesting’ Modern styling of the first edition, we felt, belied our subject matter, and the triple spacing of the lines made the text hard to read.” Couched here within a set of practical concerns is an aesthetic judgment on Cooper’s “latter-day Bauhaus design,” as she described it, that may well have relied more on *ad hominem* insinuation about her earlier work—namely *The Bauhaus*—than on a sensitive critique of the *Las Vegas* design, which seems to have been based on other factors. Scott Brown was closer to the reality with her earlier critique of “Swiss style” design, but this term may not have been well-known enough to readers, and the Bauhaus provided an easier target, not least in the architecture culture of the late 1970s. Still, Cooper’s own relationship to Swiss design was complicated and ambivalent, and the design of *Las Vegas* takes a highly irreverent position toward it.

So-called Swiss design, despite clear linkages to the interwar period through figures like Max Bill and others, nevertheless entailed a significant evolution of the typography of the Bauhaus. Likewise, while Cooper’s practice was indebted to the New Typography circulating at and around the Bauhaus, even her Bauhaus book had not tried to pay straightforward homage to the graphic design practiced at the school. *Learning from Las Vegas* was still less in the Bauhaus spirit, and might rather have offended the authors for too much embodying the Pop or proto-

postmodern aesthetic they championed. In the end, the version of the book that remains on the shelves of so many was “stripped” of most signs of Cooper’s influence. What remains of hers, which the authors were unable to shake, was the MIT Press colophon— unabashedly modernist in its form.

The recent scholarship on *Las Vegas* has gone some ways to debunk the pretenses for the book’s redesign. For example, the authors’ dissatisfaction with the first edition was not, in fact, so much a function of poor sales, and instead existed throughout the design process. Further, the size and cost of the first edition may have been objectionable, but the authors had themselves considered a very large book in their own planning: Preliminary mockups of spreads on board, dating from 1970, and measuring 22 x 30 inches (or 22 x 15 per page), had been produced in the office of Venturi and Rauch prior to Cooper’s involvement (fig. 2.20).<sup>108</sup> Beyond their great size, these boards would have fallen victim to some of the authors’ later critiques, with their three columns of text and ample white space surrounding images (far more than in Cooper’s book). Likewise, some of the layouts are unorthodox, and indeed quite interesting. For example, those featuring the “Edward Ruscha elevation of the strip” invert figure and ground and place the running strips of photographs vertically in the outside margin of the page, with a column of text on the inside margin, or gutter, thus leaving what would be the text area or print space empty. Likewise, the process of “undesigning” the book was hardly a straightforward process. As Scott Brown, who drove the redesign, admits, “it took about six months of my life.”<sup>109</sup> According to

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<sup>108</sup> These are held in the Venturi, Scott Brown Collection, The Architectural Archives, University of Pennsylvania.

<sup>109</sup> *Ibid.*, 18.



some of the Press's designers, Scott Brown's involvement was unrelenting and forceful, causing the redesign to far exceed the time and budget allocated for the process.<sup>110</sup>

### *The Legacy (Lessons Learned)*

Cooper considered her conflict with the authors as a “battle of wits.”<sup>111</sup> And in a sense, both parties won: Cooper got her design for the first edition, which emerged relatively uncompromised, despite the authors' many objections, and it is an iconic work, long scarce but now available once again. The authors also won, with their revised edition, which remains in-print and affordable, and was designed precisely to their specifications. The second edition of *Las Vegas* works as a foil to the first, and it may well be, as Vinegar suggests, that the true “text” of *Learning from Las Vegas* is located somewhere between the two. With the Bauhaus book, Cooper displayed an interest in translating and remediating her work in different forms, and in *Las Vegas*, the translation was even more nuanced, from myriad research materials in different media, into a first work, and eventually, unwittingly, into a second.

Likewise, as an idea, the authors' premise, and certainly their language, has proved quite durable: The phrase “Learning from” has become a ready template to be used or abused for all manner of architectural, urbanistic, or design thinking, as it relates to research. In their own writing, independently or together, and in their teaching, Venturi and Scott Brown could not stop learning: They were also intent on “Learning from Lutyens” (1969), “Learning from Levittown” (1970), “Learning from Pop” (1971), “Learning from Brutalism” (1990), and “Learning from

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<sup>110</sup> Vinegar, 146–7.

<sup>111</sup> Janet Abrams, “Muriel Cooper: 1994 AIGA Medal,” *I.D. Magazine*, September/October 1994, n.p., Reprinted on AIGA website: <http://www.aiga.org/medalist-murielcooper/>.

Tokyo and Kyoto and Nikko” (1999). Likewise, others seeking to learn about them, through interviews and conversations, have suggested “Learning from Africa” (1995), “Learning from Vaccaro” (2002), “Re-learning from Las Vegas” (2004), “Learning from Venturi & Scott Brown” (2005), “Still Learning From Las Vegas” (2005), and “Learning from Hangzhou” (2009). The projects playing off of or paying homage to theirs in name are too many to pinpoint, as is the proliferation of the architectural travel studio which takes stock of a site and its surrounding culture— or the idea of writing about cities as manifestos, rather than writing manifestos of cities (Rem Koolhaas has acknowledged this influence on his *Delirious New York: A Retroactive Manifesto* of 1978).<sup>112</sup> Perhaps the closest parallel to the runaway success of this template, often in both aesthetic and conceptual terms, might be the spate of books paying homage to that friend of the Vegas Studio, Ed Ruscha. Their titular concept usually follows the format *Various [plural noun]; [Number of] [plural noun]*; or *Every X on the Y*. They are usually rendered in a deadpan, slab-serif, centered type.<sup>113</sup>

Both Vinegar and Golec’s accounts, independently, work to recuperate Cooper’s design in terms of its consonance with the authors’ broader aims. At least in part thanks to Cooper’s own ambivalent relationship to her modernist forbearers, Vinegar argues, “One might have expected a degree of overlapping interest between Cooper and Scott Brown rather than out-and-out conflict.” And, he notes: “Cooper’s attempt to find a coherent yet flexible order within the

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<sup>112</sup> Rem Koolhaas, in “Flâneurs in Automobiles: A Conversation between Peter Fischli, Rem Koolhaas, Hans Ulrich Obrist,” in *Las Vegas Studio*, 169. See Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan* [1978] (New York: Monacelli Press, 1994).

<sup>113</sup> Many of these are documented in Jeff Brouws, Wendy Burton, and Hermann Zschiegner, eds., *Various Small Books: Referencing Various Small Books by Ed Ruscha* (Cambridge, MA: MIT Press, 2013).

complex amalgam of image and text in the book would seem to be in sync with *Learning from Las Vegas*'s attempt to find the "order" within the "chaos" of the Las Vegas strip."<sup>114</sup>

Likewise, Golec argues:

Cooper's design is in keeping with the subject matter of the author's text. In fact, it is my contention that, in spite of Venturi, Scott Brown, and Izenour's misgivings and Scott Brown's redesign, Cooper's design fully realizes the authors' desire to image the city in textual and visual representations that establish identifiable sets of schematic instructions to construct corresponding images of Las Vegas in the mind.<sup>115</sup>

Cooper's design seems to have been objectionable in part because—not in spite of—its being its own kind of essay in Pop and postmodern graphic design. Cooper's playful relationship to the grid and use of both heavy and very loose type is self-consciously "ugly and ordinary," vis-a-vis the pristine tenets of Swiss modernism, as practiced by a Josef Müller-Brockmann or Karl Gerstner. Cooper knew better, but was ironically winking at these traditions and subverting them. Her work on this book would indeed come to be considered an early example of Pop and postmodern impulses in graphic design.

Moreover, the question of "ugly" convention versus "heroic" innovation was not so clear in this case. Scott Brown, in describing her success at winning the cover design she sought, only to have it be covered by Cooper's dust jacket, lamented: "She tried to hide this host of sins with a Helvetica-bedecked, glassine dust jacket. We hated this H&O [heroic and original] fig leaf but I'm told that, where it survives, it adds to the selling price of the book."<sup>116</sup> Besides the possibility that one could argue that such a dustjacket represents a kind of "decorated shed," with its purely applied form of "signage" advertising the interior, it is also striking that Scott Brown noted the

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<sup>114</sup> Vinegar, *I Am a Monument*, 136.

<sup>115</sup> Golec, "Format and Layout in Learning from Las Vegas," 32.

<sup>116</sup> Scott Brown, "Comments," 18.

“Helvetica-bedecked” cover in this 2007 interview, calling out the typeface for condemnation. In the same year, the typographer Erik Spiekermann railed against Helvetica—in an eponymous feature-length documentary, the first dedicated to a typeface—by complaining “It’s air, you know. It’s just there. There’s no choice. You have to breathe, so you have to use Helvetica.”<sup>117</sup> This idea, that the typeface was “boring and bland” was by then well-established.<sup>118</sup> Yet even in the 1970s, Cooper’s designers at the Press knew that Helvetica was to be their default, their clean, if rather matter-of-fact, normal. Cooper’s own relationship to the Swiss tradition was ambivalent, as with her admission that she was “a modernist, but an uneasy Swiss.”<sup>119</sup> For many typographers, still steeped in the calligraphic, humanist tradition, Helvetica would have been ugly; and for Cooper, by the early 1970s, it was rather ordinary. In this way—and in its deadpan expression of the book’s contents as a kind of wrapper—Cooper might well have understood it as both ugly and ordinary. In objecting to Cooper’s “‘Swiss graphics’ approach,” Scott Brown observed that “All this was done in the name of modernity, yet the design followed, not the early Modernism that we loved and still love, but the tired, late 1960s, ‘Heroic and Original’ Modern style, the ‘worn-out poetical fashion’ that T.S. Eliot described. This was the very approach that we were contesting. What a mixed message!”<sup>120</sup> Nevertheless, one wonders how “tired” and “late” a modernism would need to be, by this standard, before it could be considered ordinary. Likewise, the very collaging of these two visual languages, literally superimposing them, and noisily jostling the graphics inside, embodied nothing if not Venturi’s earlier idea of “complexity

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<sup>117</sup> Gary Hustwit, *Helvetica*, documentary film, 2007.

<sup>118</sup> Erik Spiekermann quoted in Fay Sweet, *MetaDesign: Design from the Word Up* (New York: Watson-Guption Publications, 1999), 16.

<sup>119</sup> Lupton, “Muriel Cooper.”

<sup>120</sup> Scott Brown, “Comments,” 17.

and contradiction,” and ran quite contrary to the “less is more” mantra he lampooned.<sup>121</sup>

Nevertheless, the authors were quite correct that the first edition of the book was both heroic in its scale and original in its overall form— a source of pride for Cooper, contempt from the authors, and buzz for the public. The authors hoped that their argument alone would create a stir, but the response to the first edition was no doubt overdetermined.

Cooper’s design assignment for *Las Vegas* itself seemed to be a moving target, and it is likely that the authors at some point gave the impression that they might have wanted “a duck” (the original layout boards are nothing if not heroic in scale and original in composition), while at other times suggesting that a deadpan, “decorated shed” is what they desired, as a modest vessel for a serious and scholarly project. Whether this was an evolution in thinking from the first to the second over the course of the project, or whether the input was mixed, is unclear. Following the lead of their own diverse work, whether in exhibition or architectural design, would also have been ambiguous. Cooper needed to navigate what Vinegar terms the authors’ “comico-aesthetic doublet,” or: “the attitude of the jester—with an emphasis on sensory overload, excess, and motley presentation—coupled with their deadpan approach, with its emphasis on restraint, modest design, and low-key presentation.” This, as he acknowledges given their own changing standards, “was a Sisyphean task.”<sup>122</sup> Scott Brown’s reference to their “game of melding pop culture, high culture and high jinx—our kind, not Muriel’s,” suggests that even if Cooper had fulfilled each of these criteria, that it would still, necessarily, have been deemed “her” brand of it, not “ours.”

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<sup>121</sup> Venturi famously declared, of modern architecture’s mania for diagrammatic oversimplification, “Less is a bore.” Venturi, *Complexity and Contradiction*, 17.

<sup>122</sup> Vinegar, 158–59.

Golec has also suggested that the two parties held fundamentally different conceptions of objectivity. In this argument, borrowing from the work of Lorraine Daston and Peter Galison, Scott's Brown's revised edition assumes a 19<sup>th</sup> century idea about objectivity in keeping with the scientific atlas.<sup>123</sup> By contrast, Cooper held an early 20<sup>th</sup> century, subjective "judgment against objectivity," in which her professional expertise as a designer enabled her to enhance the data at hand. Golec writes: "The apparent incommensurability of subjective judgment and objectivity instantiated by the differences between the dynamic (or subjective) first edition and the deadpan (or objective) revised edition of *Learning from Las Vegas* is further complicated by the fact that Cooper's design is in keeping with the subject matter of the author's text."<sup>124</sup> Still engaged with the legacy of the book, Scott Brown was aware of Golec's argument (he was in contact with her during his research), and later dispelled the idea: "Some critics have accused us of trying for a 'false objectivity' that has been belied by modern science—as if they were the only ones to have heard of Einstein. But our approach was, of course, subjective: it's just that U&O ['Ugly and Ordinary'] turns many categories on their head—not only revolutionary and anti-revolutionary, but also objective and subjective."<sup>125</sup> If the book does indeed turn these categories on their heads, then this claim is difficult to grapple with.

Ultimately, beyond the specifics of the book's argument, it seems Cooper's major offense was to venture too far into the meaning-making territory of authorship for the titular authors' taste by giving the project its meta-form. This not least as the authors considered themselves

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<sup>123</sup> Lorraine Daston and Peter Galison, "The Image of Objectivity," *Representations* 40 (October 1, 1992): 81–128. Peter Galison, "Judgment against Objectivity," in Caroline A. Jones, Peter Galison, and Amy E. Slaton, eds., *Picturing Science, Producing Art* (New York: Routledge, 1998).

<sup>124</sup> Golec, "Format and Layout in Learning from Las Vegas," 32.

<sup>125</sup> Scott Brown, "Comments," 18.

“designers,” and referred to themselves as such throughout the book. Yet in spite of Scott Brown’s emphasis on equal collaboration with Venturi, the duo’s credit to Izenour, the acknowledged creative relationship with Rauch, and the collaborative nature of the Vegas Studio—with different students responsible for different graphic elements of the book—Cooper’s “outside” influence may have seemed threatening in itself. Vinegar calls this the question of “the third.” He writes: “Within Venturi and Scott Brown’s impressive articulations of new kinds of community, and despite their positive stress on inclusion, collaboration, and nonsexist practice, they still struggle with what I will simply call the ‘third’—that is, anyone or anything that disrupts the ‘internal’ cohesion or communication of a system, group, or entity, and in response is given supplementary status, disavowed, or deemed as ‘merely outer.’<sup>126</sup>

Cooper’s aversion to single-minded clients with unshakeable preoccupations about form was one of the reasons for her early distaste for advertising. Still, it is striking how much autonomy she was granted by the Press to produce a bold object at great cost for high-profile designers who nevertheless disliked the design. As Scott Brown recalls: “We had no say in the choice of the design or the designer. They were mandated by the MIT Press, who selected Muriel Cooper, a renowned graphic artist of the time.”<sup>127</sup> This “selection” was logical, and indeed expected, given that Cooper was the Design Director for the Press. Likewise, as a matter of course, then as now, the Press retained full autonomy over design in its contracts with authors. Yet Cooper’s success, within the organization, and against well-regarded designers, in realizing her own intentions with minimal compromise, was also no doubt a testament to her tenacity and

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<sup>126</sup> Vinegar, 123–124.

<sup>127</sup> Scott Brown, “Comments,” 17.

force of personality. It seems a striking fact of history that two of the most under-recognized<sup>128</sup> and strong women in their respective design professions would, ultimately, become locked in conflict with one another about the realization of their own creative visions. At the same time, this narrative is also an oversimplification. The misalignment of aims between authors and designers was also, as Vinegar has recently and succinctly put it, “a matter of timing.”<sup>129</sup>

As *Las Vegas* continues to be historicized, guided by the question of what can be learned from the “Learning from”—in pedagogical, architectural, urbanistic, or social terms—it is also instructive to ask what Cooper, or the graphic design discipline—might have learned from the encounter. For Cooper, the ordeal seemed to stoke her growing frustration with dealing with single-minded authors, whose “preconceptions” shaped the project before the design process had even begun. The duration and labor intensiveness of the project, its high cost, the ultimate scarcity of the object, and its fixity despite a desire to emulate dynamism, also contributed to Cooper’s desire to pursue other media beyond print.

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<sup>128</sup> See Mimi Zeiger, “Denise Scott Brown and the Fight for Recognition,” *Architectural Review*, March 13, 2017, <https://www.architectural-review.com/rethink/denise-scott-brown-and-the-fight-for-recognition/10017677.article>.

<sup>129</sup> Aron Vinegar, presentation for the panel “Vegas: Architecture, Urbanism, and the American Dream,” Boston Book Festival (Boston, October 26, 2017).



## Special Projects

Starting in the mid-1970s, Cooper added “Director of Special Projects” to her title at the Press.

She also turned her attention increasingly to experimental printing and new media. As she explained:

The 70s was the period of alternative book art—Xerox machines and corner copy shops were beginning to spread out, becoming more available. I was at MIT Press. I got support from the director to look into other media, electronic media. I pushed to get computer typesetting in house, which would give me an opportunity to explore the medium. I pushed for an experimental arm of the press that would do smaller edition experimental books. ... So I had a little support for this R&D unit at MIT Press. It was eventually shut down for financial reasons. We did some stuff with rubber stamping, cut and paste—it was the *Whole Earth Catalog* era.<sup>130</sup>

Indeed, in 1972, the Press catalog paid homage to the *Whole Earth Catalog* in its dense, DIY, collaged style (fig. 2.21). The intellectual kinship was substantial; after all, the epic countercultural publication’s mantra was “access to tools,” which related closely to Cooper’s own ambition to be directly engaged in the means of production, and many of the “tools” offered in the pages of *Whole Earth* were in fact intellectual ones: Several MIT Press books were featured.<sup>131</sup> Likewise, *Whole Earth* modeled an open and responsive medium in print; products appeared in it based on the recommendation of readers and users.

The Press’s books from this period are characterized by a rougher, collage aesthetic, closer to the underground and countercultural publications of the period than either its earlier, Swiss-inspired style, or what one would expect of a venerable and rather staid institution like MIT. But this was less about style than process: In 1974, MIT published Herbert Muschamp’s *File Under Architecture*, a book Cooper typeset on an IBM Composer electric typewriter (fig.

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<sup>130</sup> Lupton, “Muriel Cooper,” n.p.

<sup>131</sup> Incidentally, the founding editor of the *Whole Earth Catalog* later wrote the most extensive history of the MIT Media Lab, despite dramatically underrepresenting Cooper’s work there. Stewart Brand, *The Media Lab: Inventing the Future at MIT* (New York: Viking, 1987).

2.22). This consumer tool allowed her to have far greater control and quicker feedback, and also to produce a book more economically. The Composer's interchangeable type ball allowed Cooper to set the body copy in a typewriter font but to set the marginalia, which carried Muschamp's musings in capsule form, in appropriately eclectic type, ranging from a garish script to a crisp sans serif. The book, which discussed the ephemerality of the built environment, was printed on brown kraft paper and bound in corrugated cardboard, playfully suggesting its own mortality. Muschamp was apparently quite pleased with the design, and thought it communicated his argument—which professed a greater faith in the durability of the written word than the built form—better than the text had.<sup>132</sup> Explaining at the start of the book that he “is an architect who has neither designed nor built any buildings nor has the inclination to do so,” Muschamp wrote:

Buildings have such short lifespans nowadays, and few bother to look at them, anyway. Planning schemes must be revised each year, and still can't keep up. Last winter's cosmic-comical conceptual designs are forgotten with the appearance of the new spring line. Books last longer, take up less space, are easier to take care of, make better gifts than do most buildings.<sup>133</sup>

Other books of the period had a similarly rough and ready aesthetic. In 1973, MIT published German artist Otto Piene's book *More Sky*, a guide to public interventions for the artist-planner, with Piene's own hand-drawn illustrations combined with body text in typewriter font (fig. 2.23). The following year, Piene became director of MIT's Center for Advanced Visual Studies, which Kepes had established in 1968 to create work at the nexus of art and technology. Another economical, roughly textured book, *The Responsive House*, of 1974, simply collated speakers' papers from a conference related to the aims of the Architecture Machine Group, adding only minimal typographic interventions such as pagination (fig. 2.24). Another text in this

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<sup>132</sup> Cooper says that she received a letter from Muschamp “saying that he thought the form of the book expressed his thesis better than his own writing.” Cooper, quoted in P.D.D., “Muriel Cooper: Finding room within publishing to explore the outer horizons of book design,” *Publishers Weekly*, Vol. 210 no. 23, December 6, 1976, 37.

<sup>133</sup> Herbert Muschamp, *File Under Architecture* (Cambridge, MA: MIT Press, 1974), 1.

spirit was *Taking Part: A Workshop Approach to Collective Creativity*, also from 1974, by Lawrence Halprin and Jim Burns (fig. 2.25). It combined loose, hand-drawn illustrations with photography and typewritten text to describe exercises in “collective creativity” that spanned architecture, landscape, and performance, in a book whose design itself seemed improvisational.<sup>134</sup> Cooper’s approach fit both the ethos of the design culture reflected in these publications—one that privileged process and pedagogy over form—as much as it anticipated her own efforts in design education in the years to come. The publications also let her experiment with new technologies that would soon be incorporated in her teaching: the 3M Color-in-Color photocopier, for example, entered the Press design office as part of what Cooper considered her “research and development” division.<sup>135</sup>

Another of Cooper’s roles, by the mid-1970s, was to aid in acquisitions for the Press. Cooper brought in her MassArt classmate Donis Dondis’s book *A Primer of Visual Literacy* (1971, and still in print), which included MIT Press books and works from Design Services to illustrate its precepts. Cooper also had a hand in bringing in the English language translation of her colleague Karl Gerstner’s *Compendium for Literates: A System of Writing* (1974).<sup>136</sup> Out of personal conviction, Cooper acquired Donald McCullins’s *Is Anyone Taking any Notice? A Book of Photographs and Comments* (1973), which paired McCullin’s war photography, much of it

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<sup>134</sup> Lawrence Halprin and Jim Burns, *Taking Part: A Workshop Approach to Collective Creativity* (Cambridge, MA: MIT Press, 1974).

<sup>135</sup> In 1976, Cooper explained: “Publishing puts no real money into research and development, to try new product designs and ideas.... So in publishing, you have to make room for new things by reorganizing from within the operation.” Muriel Cooper, quoted in P.D.D., “Muriel Cooper,” 38.

<sup>136</sup> It is unclear when Cooper first met Gerstner, though she knew him well enough to address a new year’s invitation to him in 1966 (Cooper Collection, 12-240). Ralph Coburn recalls that Gerstner visited the Office of Publications early on, in recognition of its typographic work. Ralph Coburn, interview by author, telephone, February 23, 2012.

from Vietnam, with the words of Nobel Peace Prize laureate Aleksandr Solzhenitsyn. Cooper set off the photographs with dramatic white space, and set the text with line breaks; as her colleague Sylvia Steiner pointed out, in pairing these elements, Cooper was acting not just as the designer, but also as the editor.<sup>137</sup> By the late 1970s, Cooper also aimed to establish a category of the Press list under the heading “Visual Communication,” a term consistent with the example set by Kepes in his teaching and publications. “My sense of the design writings now in print is that much of the historical and seminal works have gone out of print—and I find that many of my students, and many young graphic designers have never been in touch with the history—in fact they have lost touch with the preceding generation.”<sup>138</sup> Cooper had in mind both new publications and reprints of out of print classics. The first reprints she proposed were: Paul Rand’s *Thoughts on Design* (1947), Karl Gerstner’s *Designing Programs* (English edition, 1964), and indeed Kepes’s *Language of Vision* (1944), and *The New Landscape in Art and Science* (1956).<sup>139</sup>

## Computergraphics

The logical extension of Cooper’s innovations in process at the Press was the introduction of in-house computer composition at the Press. The system that was finally implemented, after some false starts, was known internally as “Computer Graphics.” When introduced in 1979, it was the

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<sup>137</sup> Sylvia Steiner, email to author, April 12, 2015. Cooper once remarked, of the publishing process: “Ideally, all of the creative functions would take place simultaneously—in fact, the ideal project team would not have a separate editor and designer; one person would do it all. But of course you can’t find enough of these universal people, so we must fall back on teams of specialists.” For these specialist teams, however, “true professionalism” and “mutual respect” were essential. One might reasonably assume that Cooper found these qualities lacking in, for example, the acrimonious process of designing *Learning from Las Vegas*. Muriel Cooper, quoted in P.D.D., “Muriel Cooper,” 40.

<sup>138</sup> Muriel Cooper, “DRAFT—Visual Communications Proposal, 4/3/1978,” Cooper Records, box 6.

<sup>139</sup> These reprints did not ultimately appear from the Press, though both the Rand and Gerstner titles have been reprinted in the past decade. See Paul Rand, *Thoughts on Design* (San Francisco: Chronicle Books, 2014). And Karl Gerstner, *Designing Programmes* (Baden: Lars Müller, 2007).

most advanced in use by any academic publisher. By bringing typesetting in-house, and digitizing it, the aim was to reduce costs, increase efficiency and flexibility, and maintain high design standards. The challenges of typesetting were especially complex for the Press, given the need for technical symbols, equations, and tabular information in math and science books, as well as more advanced page layouts in the arts, combining text and image. The Computer Graphics system consisted of an ATEX 8000 computer for data entry and text editing and an Aps CRT (cathode ray tube) typesetter.<sup>140</sup> Manuscripts were fed into the computer with a magnetic disc, either by a typist at a terminal, or by way of a Kurzweil optical scanner, which could be “trained” to recognize letters and symbols in many different typefaces.<sup>141</sup> A file system on the machine allowed discrete chapters, design specifications, and other material to be parceled out. For output, the CRT typesetter exposed a continuous roll of photographic paper; this digital system, by shooting light at the paper, rather than relying on metal type, could render any typeface that was programmed in, at any size. The paper output served as galleys, which were then proofed, corrected, printed again, and so on. The galleys were finally pasted up onto pages and sent to the printer as before.

These new technologies also introduced new protocols at the Press. As Cooper wrote in an internal memo: “Book production is very much a man-machine system. The interactions

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<sup>140</sup> Cooper describes the system in an internal Press document dated April 1979, Cooper Records, box 21. The ATEX company, based in Bedford, Massachusetts, and founded in 1973, produced machines for computer typesetting and editing. It merged with Eastman Kodak in 1981.

<sup>141</sup> Optical character recognition was the first major innovation brought to market by Ray Kurzweil, who received his undergraduate degree from MIT in 1970, where he studied with Marvin Minsky. Kurzweil’s unique innovation was omni-font character recognition, by which almost any typeface could be read by computer. Kurzweil focused consistently on machine learning, and he later developed computer speech recognition, before considering computer generated poetry and financial services. Kurzweil, who coined the term “the singularity” to describe a predicted state in which machine intelligence will exceed that of humans, was hired by Google in 2012, allegedly with a single-sentence job description: “to bring natural language understanding to Google.” Holman W. Jenkins Jr., “Will Google’s Ray Kurzweil Live Forever?” (interview), *Wall Street Journal*, April 12, 2013, <https://www.wsj.com/articles/SB10001424127887324504704578412581386515510>.

between the machines that set type for [sic], print, and bind the books and the humans who write, acquire, edit, design, handle production for, paste up, index, promote, and market the books (not to mention those who run the machines) are complex and filled with all sorts of feedback loops.”<sup>142</sup> Noting that a change in any part of this system would affect the others, Cooper outlined a set of protocols for Press staff to follow. “In-house composition has the potential to improve both the quality and efficiency of our typesetting, yielding better-looking books produced on more rapid schedules; but this potential will be realized only if the new machinery is integrated into the day-to-day operations of the Press in a thoughtful and realistic manner.”

Cooper’s protocols reflect standards she established early on at the Press (before in-house composition) and surely also ones that predate her. Yet they are instructive concerning her approach as a design director, and in light of some of the divergent views she and the Press’s authors had on matters of design. Indeed, these are human problems, organizational problems, rather than technological ones. For example, on the approval of sample pages, she writes that the aim is to “eliminate [the] element of surprise in our dealings. But in the end,” she continues, “the author should understand that sample pages are not an invitation to express inchoate artistic (or antiartistic [sic]) longings; there must be a clear distinction between negotiable items (mistaken interpretations; elements that might obscure an author’s intention) and basic design, which remains the prerogative of the Press.” On the question of approving jacket design, she writes: “Once again, the solution—to the extent that a general one exists—is cooperation. Authors’ desires, if they exist, should be gauged in advance by Acquisitions and transmitted to Design.” Likewise, while computation could make much shorter work of typesetting a manuscript,

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<sup>142</sup> Muriel Cooper, “Book Production Protocol” (memo), April 1979. Cooper Records, box 21.

questions of judgment, such as making an index, were considerably harder. “Until somebody develops a computer complex enough to digest and understand a whole book, the ideas and not just the words—and spew out a thoughtful index on command,” Cooper wrote, indexing would be a human task (indeed the job of the author), and one of the most time-consuming aspects of the process.

While these innovations significantly streamlined the design and production process, Cooper grew increasingly impatient with her role, and the limits of the medium. As she would later reflect, citing a litany of frustrations:

The inequitable constraints placed on verbal and visual information by the double page; the early closure demanded by the mass production cycle; and the crush of deadlines that prevented research into new solutions for communication problems all contributed to my growing frustration with the print medium. It was clear that the computer would soon have a profound impact on these limitations.<sup>143</sup>

It was these concerns, and this curiosity, that would prompt the next chapter in Cooper’s career.

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<sup>143</sup> Heller, “Muriel Cooper,” 99.

### **Chapter 3. Visible Language Workshop Teaching Experimental Printing in a School of Architecture**

Cooper's most sustained role at MIT was not as a designer, but as a teacher and an administrator. Equipped with her experiences at the Press, Cooper designed a program to teach undergraduates and advise graduate students in the Visible Language Workshop (VLW), and later educated industry professionals on the possibilities and future of print media: freshman looked to her as an arts instructor, while graduate students and technology companies looked to her as a kind of seer, prophetic about a rapidly changing discipline. Cooper was not teaching her students typography, or even graphic design, per se, but rather her own peculiar hybrid of media design, hands-on production, visual studies, and to some degree art history. Consequently Cooper, and the facilities she designed at MIT, came to serve as a nodal point for new arts practices across the Institute, and she found herself uniquely positioned to think and work at the intersection of art and technology, new and old media. How she did this, and did so within a school of architecture, is the subject of this chapter. Examining the distinctive nature of Cooper's program, and her teaching—her pedagogy, her classes, and her lessons—offers unique insight into her thinking as a different kind of designer and media artist. While much of this teaching may seem elementary in retrospect or in isolation, in total it represents a new mode of thinking about design and media, one that Cooper actively helped to forge.

Cooper was trained as an educator. After graduating from the Massachusetts School of Art in 1948, she returned there, and received two degrees, in 1951: A Bachelor of Fine Arts (B.F.A.) and a Bachelor of Science (B.S.) in Education. Both Cooper's siblings were also teachers: Charlotte (Lopoten), the youngest sister, taught elementary school; Helene (Jackson),



the middle sister, was a professor of psychiatric social work.<sup>1</sup> The practical decision to become a teacher, after studying studio art, was also not unusual for women at this time.<sup>2</sup> Before and during her time at MIT, Cooper worked at other institutions.<sup>3</sup> The teaching at MIT, however, starting in 1974, also signaled a new direction in her thinking based on her research at the Press. At MIT, Cooper focused on visual communication, print, and production, rather than on typography as such.<sup>4</sup> Some of the techniques she taught she would have learned in school; others she learned from peers, or came upon herself by experimentation; and still others, especially of a high-tech nature, would have been unthinkable without the expertise of one largely unsung figure, the physicist-photographer Ron MacNeil, who co-founded and co-directed the Visible Language Workshop.

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<sup>1</sup> Jackson, who died April 21, 2008, worked as a professor at Boston College, Columbia University, and the University of Nevada, Las Vegas. Among several publications, she was co-author, with Ronald Nuttall, of the widely consulted book *Childhood Abuse: Effects on Clinicians' Personal and Professional Lives* (Thousand Oaks, CA: Sage Publications, 1997). "Obituary, Dr. Helene Jackson," *Las Vegas Review Journal*, April 27, 2008.

<sup>2</sup> Graphic designer and contemporary of Cooper's, Elaine Lustig Cohen (née Firstenberg, born in 1927), made a similar calculation. According to her obituary: "Ms. Firstenberg studied art at Sophie Newcomb College, part of Tulane University, in New Orleans. After two years, believing her only art-career option as a woman was teaching, she transferred to the University of Southern California to major in art education. She received a bachelor's degree in 1948." Anita Gates, "Elaine Lustig Cohen, Designer Who Left Her Mark Everywhere, Dies at 89," *The New York Times*, October 7, 2016 <https://www.nytimes.com/2016/10/09/arts/design/elaine-lustig-cohen-designer-who-left-her-mark-everywhere-dies-at-89.html>.

<sup>3</sup> In 1951, Cooper taught design for a year at the University of Maryland; in 1959–60, she taught night classes at Boston University; starting in 1962 she was Associate Professor of Design at the Massachusetts School of Art; and she had brief stints at Simmons College and the School of the Museum of Fine Arts, Boston (SMFA). At Simmons, Cooper was a guest lecturer in a pre-professional program that trained college seniors for jobs in the publishing world. Cooper's designs during this period for the *Simmons Review*, as Dietmar Winkler recalls, were decidedly unorthodox, and even Duchampian—with the publication packaged in a bag or a can, and deemed the "Mag in the Bag" or "Mag in the Can"—and formed not just a marked contrast with the Swiss-style work with which Cooper is associated, but likely also a welcome departure from the more practical lessons taught to Simmons students at the time. Dietmar Winkler, email to author, December 21, 2017. The issue of *Simmons Review* delivered in a bag was Fall 1966 vol. 49 no. 1. The course in which Cooper was involved was "PUB 51-1, 2: Senior Seminar in Publication," required for students in the publication program and dedicated to producing the *Simmons Review*. Lauren Loftis (Library Assistant, Archives, Simmons College), email to author, January 12, 2018.

<sup>4</sup> Cooper invited colleagues to her courses to speak about typography. Dietmar Winkler recalls: "Fred Brink, a very talented Boston photographer, and I made elaborate and time consuming slide presentations on dynamic movable graphics and typographics to Cooper's design students, when she taught at Massachusetts College of Art in Boston." Winkler also recalls that these guest lectures did not come with honoraria, the reimbursement of expenses, or even much acknowledgment: "That would not have been her." Winkler, email to author, November 27, 2017.

## **Ron MacNeil**

Cooper met MacNeil through a mutual friend, and based on their common interests. The friend was Tom Norton, a graduate of the Rhode Island School of Design who was at first a jewelry and theater set designer before turning his attention to electrographic media, that is, the dry photocopying technology behind xerography. Norton had helped Cooper install a 3M Color-in-Color machine, an early color photocopier, at the MIT Press, establishing what Cooper called an “electrographic print studio” there in 1973.<sup>5</sup> He would go on to become a “research affiliate” in Cooper and MacNeil’s program starting in 1975, where he would also teach courses in electrographics for years to come. Sometime in 1973, Norton introduced Cooper and MacNeil.

Sixteen years Cooper’s junior, MacNeil had studied physics as an undergraduate at the Rochester Institute of Technology. While there he began an apprenticeship with the photographer Minor White. MacNeil followed White to Arlington, Massachusetts, in order to set up and run the studios White built there as he was establishing the Creative Photography program at MIT, starting in 1966.<sup>6</sup> In 1971, MacNeil started teaching a course on new imaging technologies in the Department of Architecture called PhotoGraphics. To allay MIT’s concerns about his teaching without a degree, MacNeil was able to “cobble together” a Bachelor of Science in Art and Design (B.S.A.D.) degree the same year, by “taking” his own class twice and by enrolling in Nicholas Negroponte’s Soft Architecture class, where he learned to use the recently developed PL/I computer programming language.<sup>7</sup> Around 1973, MacNeil decided to

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<sup>5</sup> VLW Biographies, n.d., Cooper Records, box 5.

<sup>6</sup> Ronald MacNeil, C.V., n.d., Cooper Collection, 12-284.

<sup>7</sup> Ron MacNeil, email to author, January 28, 2014.

assemble enough of his photographic work to be considered for an M.F.A. at the Rhode Island School of Design. The work baffled the department, and defied easy description as photography; MacNeil's MFA project extended the idea of trompe l'oeil into three-dimensional space before collapsing it back into two dimensions: in one work, he photographed his hand, offset printed the picture onto thin white PVC plastic, heat formed this over a plaster cast of his other hand, and created a large-format Polaroid of the finished product (fig. 3.1). The department's perplexity notwithstanding, he earned his M.F.A. in 1976.

At MIT, it was MacNeil's experimental photographic techniques that had first gotten him into trouble, but also that had launched his career there, allowing him to find the space he needed. He recalls:

I started printmaking experiments in the graduate student dark room, using etching fluids which had etched through his [Minor White's] copper pipes. I had burned through his drainage. So he said "let's find him some space." They gave me a huge place on the top floor of Building 5, enough support to buy offset presses... [and so I] built etching presses, started doing multimedia experiments. This was around 1970–71.<sup>8</sup>

The practice at MIT at the time was that spaces not being put to good use, for example by a professor on leave, would be quickly repurposed to serve new needs. MacNeil's experiments won him the space and resources that would be the basis for the venture he soon began with Cooper. But it was his approach to making that gave the two common ground: both MacNeil and Cooper were frustrated by the limitations imposed by commercially available reproduction media and mass production processes, and sought to invent new tools that offered greater control, quicker feedback, and more flexibility. MacNeil observed:

As a photographer, I became upset that Kodak told me what the surface of the work I was creating was going to look like. [There was a] very limited scope of experimentation you could do once you said "I'm a photographer." I think one of the things that brought us [he and Cooper] together was that that was true in publishing too. There was a process. It could

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<sup>8</sup> Ron MacNeil, interview by author, telephone, February 22, 2012.

take weeks to make one change in the manuscript. Every change you made was hugely expensive. It just drove her nuts. All the things she wanted to do just couldn't be done. If you'd see the experimental work she'd done [at the MIT Press] you'd see how quickly she was frustrated. She used cardboard as a cover material. She laminated aluminum foil, etc.<sup>9</sup>

Cooper and MacNeil's common interests led them, in 1974, to co-found a program within the Department of Architecture. Their respective bailiwicks, in printing and photography, suggested the new program's dual, and deeply intertwined, strands.<sup>10</sup> They deemed it the Visible Language Workshop, or VLW for short.

## VLW

The designation of a "workshop," in contrast to the Institute's many labs, or the more standard language of a department, was not accidental. The ethos of the workshop enjoyed popularity in the mid-70s, as Lawrence Halprin and Jim Burns's MIT Press book, *Taking Part: A Workshop Approach to Collective Creativity* (1974) suggests, as just one example of this constructive, communitarian, and anti-hierarchical organizational structure. But Cooper and MacNeil's reference no doubt went back further, to the production-oriented organizational units of the Bauhaus, and its opposition to the strictures of the academy. In the mid-1970s, Cooper described her "Interests and Goals" on a draft CV in a way that telegraphed not just her pedagogy, but also her political commitments:

The significance of participatory and non-authoritarian communication forms in relation to specialization and professionalism. / Structured/unstructured relationships in learning. / Direct, responsive means of production.<sup>11</sup>

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<sup>9</sup> Ibid.

<sup>10</sup> At its inception, the VLW described itself as a project of "Muriel Cooper, Media Director, MIT Press and Ron MacNeil, Instructor in Photography & Photographics." This framing suggested the two founders' complementary competencies. VLW draft description, n.d., Cooper Records, box 4. Cooper had initially hoped that the VLW might generate experimental prototypes for the Press to distribute, and thereby serve it in a research and development capacity, though this never came to pass. See P.D.D., "Muriel Cooper," 41–2.

<sup>11</sup> Muriel Cooper, "A Chronology," n.d. [likely c. 1975, given most recent entries]. Cooper Records, box 4.

In order to be realized, this participatory, non-authoritarian pedagogy also required a particular kind of space. While Cooper's design work was limited to the screen and the page, she considered the creation of a production-oriented, pedagogical environment at the VLW to be one of her lasting contributions at MIT. Indeed, while Cooper played a significant role in shaping the design studios she helmed, first in the Office of Publications and then at the MIT Press, the VLW, in its various iterations, was the first full-fledged environment she created. Looking back on her career from the vantage point of the 1990s, she reflected: "My personal statement... is in building environments in which I would like to work and other people can work productively."<sup>12</sup> Later in her career, especially as computing became the VLW's central focus, she would continue to describe the VLW as an environment, not just housing tools, but itself as a tool, or a kind of machine for image-making. For example, in draft materials for her 1981 Summer Session in "Computers and Design," Cooper wrote: "The environment [VLW] functions as a large, interrelated, interactive, hands-on tool in which mechanical, photo-mechanical, and electronic inputs and outputs may be used generatively."<sup>13</sup>

The VLW occupied contiguous rooms along a corridor in the Department of Architecture, centrally located in Building 5 on MIT's campus (fig. 3.2). These spaces were roughly organized by process: They comprised, in sequence, a press room, anchored by two sheet-fed offset presses, which also included a letterpress and intaglio press; a pre-press "work area," which housed plate etchers and print drying and storage racks; a darkroom and VLW office; and an "image processing room," with a computer graphics terminal, video camera, 3M Color-in-Color printer, and diazo printer (fig. 3.3). Of course, Cooper was not the only author of

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<sup>12</sup> Fairbairn, "The Gendered Self in Graphic Design: Interviews with 15 Women," n.p.

<sup>13</sup> Muriel Cooper, draft summer session materials, 1981, Cooper Records, box 6.

these spaces. MacNeil, VLW instructors, and even the students—dedicated to making it a workable environment—participated. Indeed, a group of students once took it upon themselves, under cover of night, to tear down a wall between the VLW pre-press work area and the dark room, obviating the need for a much longer walk down the corridor, and both symbolically and functionally melding the activities of printing and photography in the process.<sup>14</sup>

The unstructured, anti-hierarchical ethos of the VLW also had its downsides. Cooper was herself notoriously disorganized, in spite of—or perhaps as an impetus for—her professional commitment to organizing information, first in print, and later on screen. She dressed in flowing caftans, from whose many pockets she often struggled to fish out what she needed, and her later demonstration videos for corporate sponsors contain outtakes of her looking high and low for various items, such as her notes, before starting the demonstration, and cursing loudly in the process. Cooper’s family also testifies to her being a serial shopper. As her nephew, Jonathan Jackson, recalls:

She used shopping as her therapy. She would go to Marshalls and Loehmans and others and buy tons of crap and kept the tags on and bought a ton of clothes she didn’t need and she went to return them about six months later. And they said “you can’t return these you bought them six months ago!” And she said “I’ve been locked up in a mental institution since then!”<sup>15</sup>

She was also, as indicated by the heterogeneity of her archives—really the assembled contents of her basement at the time of her death, including mailings, old newspapers, sneakers, and so forth—also a hoarder. Jackson remarked: “She could never buy one camera, she had to buy ten cameras. I cleaned her basement every year and it filled up again.”

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<sup>14</sup> David Reinfurt, “This Stands as a Sketch for the Future: Muriel Cooper and the Visible Language Workshop,” 2007, n.p., <http://www.dextersinister.org/MEDIA/PDF/Thisstandsasasketchforthefuture.pdf>.

<sup>15</sup> Jonathan Jackson, interview by author, telephone, February 2, 2015.

This entropic energy affected the VLW space. Already in April of 1974, just months after the VLW's opening, Jonathan Green, a photography instructor and historian of photography, drafted a memo to MacNeil titled "VLW Physical Conditions" which began: "The present working conditions at the VLW are appalling." Green complained that "It took fifteen minutes to clean off the light tables," and that "There were not even adequate waste baskets to dispose of all the old Coke cans." He demanded that MacNeil "close the whole place down," and clean up before Green could again give tours to representatives of various foundations, whom he considered potential sponsors for the VLW.<sup>16</sup> The spaces apparently soon reached some semi-orderly equilibrium, surely with the help of a team of intrepid staff and graduate student TAs.

That the VLW was established within MIT's Department of Architecture continued a tradition of studio arts-related practices occurring there. Since 1945, when Gyorgy Kepes was invited to create a program in visual design in the School of Architecture and Planning, and brought with him lessons related to the Bauhaus's preliminary course exercises, the architecture department would have been the logical place at MIT for an experimental printing and photography program to appear.<sup>17</sup> An undated memo on letterhead from MIT's "Creative Photography Facility," which aimed to contextualize the VLW's work within MIT's broader mission, given its Latin motto "*Mens et Manus*" (mind and hand), and within the architectural discipline in particular, argued for the VLW's utility in helping architects to communicate visually, both in the planning and previsualization stages of projects and in their subsequent representation. The memo is unlikely to have come from Cooper; the language does not resemble

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<sup>16</sup> Jonathan Green, Memo to Ron MacNeil, Dave Thomas; copy to Donlyn Lyndon, Muriel Cooper, Mike Guran, Patsy Cumming, "VLW Physical Conditions," April 29, 1974, Cooper Records, box 4.

<sup>17</sup> Wechsler, *The MIT Years*, 11.

hers, she would not have been writing on this letterhead, and, most significantly, she rarely attempted to justify the VLW's existence in vocational terms generally, or architectural ones specifically; indeed, Cooper appeared almost oblivious to the architectural context in which she worked. Yet this was also a moment at which many fine arts-related activities were happening in this department, and relatively fewer were devoted to architecture's traditional aims.<sup>18</sup>

Nevertheless, the memo does reveal some of the institutional context into which the VLW fit, and the ways the group might have been justified or presented to Institute administrators:

Growing out of the Department of Architecture, the Workshop has an inherent concern for the design process and visible communication. The Workshop will provide architectural students with the facilities for producing innovative, quality printed matter and reproduction. The Workshop's research practices will deal directly with the specific architectural problems of graphic rendering, documentation, presentation and verbal description. In short, the intent of the Workshop in terms of architecture will be to use creative minds and advanced publication machinery to insure a more conscious, accurate awareness and pre-visualization of a finished architectural product; to provide the methods for more visually and psychologically accurate documentation and evaluation of existing architecture, and more precise methods of presentation.<sup>19</sup>

At no point, least of all in the minds of its co-directors, did the VLW actually function so directly in the service of architecture or architects. Yet the VLW's relationship to architectural practice would develop over its lifetime. While the architectural argument for the VLW might at first have had to do with visualization and representation, the group would later concern itself with the graphical interface between the designer and his or her tools, especially in collaboration with MIT's Architecture Machine Group.

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<sup>18</sup> See Arindam Dutta, ed., *A Second Modernism: MIT, Architecture, and the "Techno-Social" Moment* (Cambridge, MA: MIT Press, 2013).

<sup>19</sup> "Mens et Manus: The Visible Language Workshop," 1, Center for Advanced Visual Studies Special Collection, MIT Program in Art, Culture, and Technology.



## Messages and Means

The first course offered in the Visible Language Workshop, in 1974, co-taught by Cooper and MacNeil, was called Messages and Means. As Cooper described it, and as the course poster read, Messages and Means was about “Explorations of multiple forms of visual and verbal communication in print.” Cooper designed the two-foot-square course poster, whose credit indicates that it was printed by MacNeil (fig. 3.4). The words “Messages and Means,” in primary and secondary colors against a black square, seem to revolve around a central point in a multilayered and dynamic composition; course information appears in neat columns in the unprinted margins along each side of the sheet.

The poster exemplifies Cooper’s favored “rotation” printing technique. Instead of producing negatives on multiple printing plates, the rotation method involved applying press type to acetate, exposing the plate directly from it, and running a sheet through the press four times, changing the orientation and ink with each pass. This technique also formed the basis for her students’ first assignment. As a sign-in sheet for the first meeting of Messages and Means read: “Tonight will be a guided tour of the workshop, in particular the offset press, and we will be making participatory plates”<sup>20</sup> The participatory aspect was that a group of four students each contributed to one quadrant of the plate, creating a cumulative design. Cooper called these “one-night” prints, and they moved from conception to result much faster than a traditional offset print, using multiple plates, would. The student prints that resulted were considerably more chaotic than Cooper’s tightly controlled design advertising the course (fig. 3.5). They used multiple typefaces, sizes, and orientations, with the results, formally, somewhat resembling the collaboration of Theo van Doesburg and Kurt Schwitters on a famous Dada poster (fig. 3.6),

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<sup>20</sup> VLW course handout, n.d., Cooper Collection, 12-284.

while relying on the chance operations of a Surrealist “exquisite corpse” [*cadavre exquis*] parlor game.

While the layering of information was of great interest to Cooper, the intended lesson was not merely formal; neither, for that matter, was it supposed to demonstrate a chance operation. Instead, the rotation print served the aims of the Messages and Means course, and emblemized it, in a number of ways: It helped students to learn their way around an intimidating piece of industrial machinery, and to repurpose that tool, intended for mass production, to productive ends, producing a one-off object by way of a novel design constraint; it created a direct relationship with the tool, such that the process of thinking and making, cause and effect, conceptualization and result, could be brought closer, enabling course-correction and even play. For Cooper, the idea of “connecting concept with product,” as she put it in one course description, by “using the offset press interactively,” was about increasing the rate of feedback between thinking and making, an essential thread running through her teaching and work, in print and in software alike.<sup>21</sup> Cooper described the pedagogical benefits of the rotation print in this way:

It is a simple and a very complex idea. It is used because it provides immediate and maximum interaction with an offset press which is normally a mysterious and highly specialized reproduction tool.

The professional designer or user is separated from such communication tools and an entire intermediate language is devised for the user and the printer. Once the commitment to print is made, there is no return without great cost. Mistakes are irretrievable. Options minimal. Creativity is confined to the beginning of the process. Mass production requires this in order to survive.

Experiment and play as a part of professional discipline is difficult at best. This is not only true of an offset press but of all activities where machines are between the concept and the product.

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<sup>21</sup> Muriel Cooper and VLW staff, “Preliminary, partial listing of Fall ‘80 subjects,” Cooper Collection, 12-284.

The re-establishment of a complete relationship between process and product and person is perhaps the most valuable aspect of this course and the workshop.

In these brief comments, on a new technique using an old technology, Cooper reveals an enormous amount about her aims. Coaxing tools to be more direct and responsive, more fluid and forgiving, and to do so via experiment and play, was at the heart of her project. The last sentence, on the “*re-establishment of a complete relationship between process and product and person*” (emphasis added) is about giving makers the control of craftsmen in an age of new technological possibility.

The course title, Messages and Means, captured several aspects of Cooper and MacNeil’s goals. On the one hand, “messages,” evoked the traditional role of graphic designers as experts in visual and verbal communication, and in particular the synthesis of the two. Beyond relaying messages, or merely giving them form, Cooper encouraged personal expression in her courses, or the creation of students’ own messages. Students were required to keep and ultimately submit journals in Messages and Means. One of the assignments was to find a political message they had observed in the world and bring it in to be visualized and variously reinterpreted typographically; another was to express one’s own name in different forms, as a way of thinking about the expressive potential of typography. For these assignments, Cooper had students read and emulate Karl Gerstner’s *Compendium for Literates: A System of Writing* (1974), which she had acquired for the Press in translation as part of her “Visual Communications” series.

Cooper sought to teach her students “visual literacy.” Donis Dondis, Cooper’s peer at the Massachusetts School of Art, and later a professor at Boston University, seems to have shared her pedagogy, and was an articulate mouthpiece for it. The author of *A Primer of Visual Literacy* (1973), which Cooper acquired for the Press and assigned for her students, Dondis argued that visual literacy meant the ability to both send and receive messages communicated by form. In an

increasingly visual, or “iconic” age (Dondis quotes and notes the prescience of Moholy-Nagy’s dictum that the illiterate of the future will be the one who is incapable of using a camera), Dondis and Cooper were also interested in the power of graphic communication.<sup>22</sup> Dondis’s book catalogs the “wide palette of means for visual expression of content” that one might see in the world, or craft in the studio, and diagrams formal polarities such as balance and instability, simplicity and complexity, unity and fragmentation, and so on.<sup>23</sup> Mastering these, Dondis argues, would make one a shrewder producer and consumer of visual meaning.

The language of “messages” would also continue to have purchase as Cooper’s career developed. The term also suggested the basic units of exchange in information theory, which was a model for so much thinking at MIT in the postwar period. In this context, the meaning of the messages was tertiary to questions of their fidelity, and successful transfer, in a noisy, information-rich environment. People could send and receive messages, but so could machines, and the question of smoothing the interface of human-computer interaction eventually became a major focus of Cooper and MacNeil’s research. Designers, Cooper came to believe, would soon design not just messages, but the environments in which they circulate and appear.

The focus on means in Cooper’s early courses was a matter of process and production. She wanted her students to learn by doing, and to learn, following Marshall McLuhan, that the means shaped, were in some cases selfsame with, and occasionally superseded the messages themselves. Cooper made her students aware of the myriad means at their disposal, in the hopes that they might choose the best one to express—or as an expression of—their message. The duality of messages and means also had a fine resonance with MIT’s “*Mens et manus*” motto;

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<sup>22</sup> Donis A. Dondis, *A Primer of Visual Literacy* (Cambridge, MA: MIT Press, 1973), xi.

<sup>23</sup> *Ibid.*, 110 ff.

these words, under the depiction of a craftsman at an anvil and a scholar with a book appear on the original Institute seal of 1864. Cooper wished to train conscious makers, in control of what they were saying and how they were saying it. This followed the model of her leadership at the MIT Press, where she often worked as not just a designer, but also an editor and producer, empowered to shape meaning and in control of the means of production.

Cooper sought to strike a balance between teaching students the correct techniques and having them learn firsthand, opting for the latter and providing only basic constraints or guidelines, in keeping with her pedagogy of “structured/unstructured relationships in learning.” In undated teaching notes, for example, she went into great detail on how the rotation print might solve five interrelated problems concerning color theory during two, four-hour sessions, given a certain set of constraints: “No one has made a plate before; no one has ever operated the offset press; each cleaning of the press takes 20 minutes; [and] each group has to account for time taken to adjust registration.” She then rehearsed a “solution one,” which involved an elaborate process of creating stockpiles of different categories of plates and prints, and then exploring their systematic combination. She described this in a series of multiple steps, too tedious to elaborate here, as if listing a complicated recipe. “Solution two,” which concluded the document, was succinct: “Disregard trying to solve everything and have a good time. By relaxing in this manner, we actually accomplished [sic] much more.”

Cooper’s students benefited from the unstructured nature of her teaching, if at first somewhat uneasily. One student auditing Messages and Means in 1977, who had herself worked as a teacher and was at the time enrolled in a teacher’s credentialing program, wrote in a draft endorsement of Cooper, very likely in support of her reappointment, that: “Often, we in class felt that class assignments were not well explained. Many of us began to think Prof. Cooper had done

this purposely when we studied the rich variety of responses pinned upon the walls and experienced how much we could learn from one another.” She concluded: “It’s much to the credit of Prof. Cooper and the Teaching Assistants that despite the gross limitations of the physical plant, Messages and Means is such a total learning experience.”<sup>24</sup> Throughout her teaching career, and later as an advisor to graduate students, Cooper relied on students to figure out problems for themselves, and in particular to figure out the technical aspects of their projects— both as a pedagogical device, and because Cooper, especially in the later context of computing, was herself generally unsure of how to proceed on a practical level. Instead she offered broad, sometimes confounding, conceptual feedback, encouraging students to push their work further. Wendy Richmond, who worked for Cooper at the MIT Press before following her to the VLW, and enrolling as a student there, recalled that for years to come, in creative matters, “She [Cooper] was my mentor.” Yet Richmond agreed that a friend’s correction was more accurate: “No, your tormentor.”<sup>25</sup>

As a complement to its focus on studio-based, hands-on production, Messages and Means also served as a kind of introduction to visual culture and aspects of art history for MIT students. As Cooper described it in draft materials in 1977, the course “provides three simultaneous levels of experience”:

1. hands-on direct experience with graphic arts darkroom work and offset printing using the rotation method to reduce real time and the offset press interactively as a responsive print making tool.
2. slide presentation of a rich array of verbal and visual materials, historic, contemporary, art, literature and advertising [sic] in an effort to raise consciousness of the equal importance of the visual aspect of words and their relationship to images.

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<sup>24</sup> Dorothy Swank draft letter [addressee unspecified], September 4, 1978, Cooper Collection, 12-284.

<sup>25</sup> Wendy Richmond, interview by author, September 20, 2012.

3. short and long term problems dealing with letterforms derived from handwriting, images brought from the environment, poster and book forms and a final on going journal project which is a book and has provoked some very exciting results.<sup>26</sup>

Not much record exists of this second, lecture-based, aspect of the course. Yet Cooper's notes suggest that her lectures ranged from color theory to various topics in art history. She kept her slides in binders organized by formal characteristics, bearing names like "Dimension/Scale/Proportion," "Dot/Line/Tone," "Word morphisms," and "Motion," suggesting that some of her lessons may have resembled Dondis's focus on the elements of visual literacy. The binder "Motion," for example, contained slides of late 19<sup>th</sup> century chronophotography; Duchamp's *Nude Descending a Staircase, No. 2*; blurred figures captured in interwar experimental photography; and contemporary, high-speed photography of athletes in motion. It also contains examples of typographic work by Cooper's colleagues in MIT's Design Services office, including posters for jazz concerts and AI conferences at MIT, which overprint and offset words to create the illusion of dynamism. Cooper's fascination with language in motion naturally continued with the software projects she later oversaw, in which the illusion of motion was replaced with actual, on-screen dynamism and interactivity, expressive of content and controlled by the user.

## **Printing**

Experimental printing was the foundation of the VLW. Having an offset press was and is rather unusual for a university art program, and the VLW had two. These hulking machines, both the ATF "Super Chief," the largest in the American Type Foundry's line of offset presses,

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<sup>26</sup> Messages and Means course description, Cooper Records, box 61. Orthography and lack of punctuation in the original.

dominated the VLW's print room. It is significant that Cooper's students were able to explore not just smaller-scale historical print media, such as letterpress or intaglio (though they did this as well), but also the same printing technologies by which the MIT Press produced its books. In a typescript document about the VLW, likely written by Cooper, it is noted that the offset press is the industry standard for mass production, and a flexible one at that:

For flexibility in terms of color, stock choice, and variations of format, and for the ease of image reproduction, no other media can yet compete with offset for cheap, fast, mass production printing.

Cooper also praised this turn-of-the-twentieth-century technology for allowing the incorporation of multiple media, a persistent concern of hers:

As divisions between disciplines blur, offset presses, like copy machines, are seen as tools especially suited to combining different kinds of graphic elements— drawing, photographs, and type or writing.

Less expected, in a discussion of offset printing, Cooper also heralded this mass reproduction medium for its experimental possibilities:

While most designers are familiar with offset in terms of straight reproduction of layouts... the medium actually allows for a good deal of pre- and on-press experimentation. Negatives can be drawn or scratched on, shifted, rotated and double-burned; plates can be manipulated physically and chemically; paper and ink changes will give varied results. In addition, the final prints themselves can be seen as raw material for further working, to be overprinted on, drawn into, collaged, or bound.<sup>27</sup>

Cooper's students were simultaneously gaining what could be understood as professional experience with current printing technology *and* they were empowered to express themselves artistically with it. One of Cooper's staff members, Laura Blacklow, remembers being shocked that students were so free to use a complicated piece of industrial machinery without any real

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<sup>27</sup> Typescript VLW program material, n.d., Cooper Records, box 4.



training: “It was like the blind leading the blind.”<sup>28</sup> Indeed, the offset press was a potentially dangerous tool, if correct protocol was not followed, as at least one incident demonstrated.<sup>29</sup>

Cooper wished to impress upon her students both the specificity of each medium, and at the same time, the ways in which different media could be stretched, coaxed, or combined. A VLW “workbook,” written mainly by Roger Goldstein, a student in both the undergraduate BSAD major in art and design, and then an MArch student who taught in the VLW, explained at the outset:

There is one chapter [in the workbook] on each [printing] process. This, however, is not to imply that they are to be used in an independent manner; on the contrary, do not be afraid to combine processes, or to use the result of one process as the beginning or intermediate stage of yet another.

Each process has particularly unique qualities, and there are some images that work well for gum [bichromate printing], but lose everything in the translation into silkscreen. Keep your eyes open, look at the walls, and see samples of each process; you will probably begin to develop a sense of the appropriateness of each process.<sup>30</sup>

In addition to its teaching role, the VLW served as a studio that brought together artists and designers from across the Institute. Cooper’s former colleagues and successors in Design Services, including Jacqueline Casey and Ralph Coburn, seem to have printed several small-run posters on the VLW’s offset presses to advertise on-campus events. While Casey’s accomplished Swiss-inspired posters, dating to the early 1960s, were printed by outside vendors, it is likely that some of her later, more experimental ones were produced at the Visible Language Workshop.

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<sup>28</sup> Laura Blacklow, interview by author, telephone, July 31, 2017.

<sup>29</sup> The particulars of this incident, for the privacy of those involved, do not bear repeating, but it is a reflection of the sometimes cavalier laxity of the VLW studio environment.

<sup>30</sup> Roger Goldstein with Ellen Shoskes, Mark Diamond, Ron MacNeil, Muriel Cooper, *VLWorkbook: Visible Language Workshop, Department of Architecture/MIT* [“trial edition”], s.n., 1975, Cooper Records, box 4.

VLW equipment also proved useful for one of MIT's best-known visual artists, Otto Piene, and the program he would be named to head the same year as the VLW was founded.

### **Otto Piene and CAVS**

Shortly after Kepes founded the Center for Advanced Visual Studies in 1967, with a class comprising local artists, Otto Piene became its first international fellow. Piene had been a founder of the artist group Zero, and Kepes sought him out, visiting his first solo exhibition at the Howard Wise Gallery in New York, the 1965 show *Light Ballet*, in order to consider future collaborations.<sup>31</sup> While a fellow at CAVS, Piene served as a visiting professor of Environmental Art before succeeding Kepes as the second director of the Center in 1974. He served in this role until 1994, making his and Cooper's respective directorial positions coterminous. In describing CAVS, Piene also used the language of the workshop: "The Center for Advanced Visual Studies is essentially a workshop for artists employing sophisticated ideas and techniques. As a member of the Massachusetts Institute of Technology community, it offers affiliation with other M.I.T. minds and facilities and encourages mutual inspiration of artists and scientists."<sup>32</sup> Piene grew the program substantially; from the five fellows in residence when he took over, there were, two years later, 25, and a graduate teaching program as well. Piene selected his fellows, he insisted, based largely on their disposition toward collaboration: "The affinity to group work is not due to

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<sup>31</sup> Otto Piene and Hans Ulrich Obrist in conversation, The Mayor Gallery, *Otto Piene: A Retrospective. Paintings, Ceramics, Light Ballets, Inflatables* (London: The Mayor Gallery, 2012), 21. Wise had also shown Piene as part of the group show "Group Zero: Mack, Piene, Uecker" in 1964. Incidentally, Wise had shown Kepes in 1959, at his Cleveland location, and Piene's "Light Ballet" works bore a resemblance to Moholy-Nagy's *Light Prop for an Electric Stage*, on which Kepes had worked, and about which Piene claims only to have become aware after first exhibiting his own work (The Mayor Gallery, 17).

<sup>32</sup> Otto Piene and Elizabeth Goldring, eds., *Centerbeam* (Cambridge, MA: Center for Advanced Visual Studies, Massachusetts Institute of Technology, 1980), 20.

lack of individuality or to the herding instinct but represents an understanding of the complexities of present-day life: artistic images may still be one man's or one woman's business, but their processing may involve technological expertise even if technology is regarded by some artists as nothing more than an expanding distribution system."<sup>33</sup> In this, Piene paralleled Cooper's collaborative ethos.

Kepes believed that Piene was engaged in the kind of experimental work between art and science which CAVS was founded to advance. Piene's multimedia practice, like Kepes's, also encompassed painting, sculpture, and environmental art, with a particular focus on light and dynamism. Despite his European roots, Piene's awareness of the historical avant-garde was in fact belated—unlike that of Kepes, who was a protagonist of the period. Yet Piene's practice bore significant enough parallels to modernist projects that Wulf Herzogenrath could, based both on Piene's social concern and his engagement with technology, entertain the extended thought experiment of "Piene as Bauhaus Master."<sup>34</sup> Still, the approaches of Kepes and Piene to art-science collaborations were somewhat different. Piene's former spouse, collaborator, and CAVS colleague Elizabeth Goldring explained: "Whereas Kepes viewed the creative force of artists and scientists as complementarily similar, Piene sees essential dissimilarities in both processes and intentions. He enjoys melding this diversity into collaborations of unlikely members. It is the tension of new associations and configurations that generates the dynamism at the core of the CAVS group."<sup>35</sup>

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<sup>33</sup> Ibid.

<sup>34</sup> Wulf Herzogenrath, introduction to Kölnischer Kunstverein, *Otto Piene* (Starnberg: Josef Keller Verlag, 1973), viii. Herzogenrath, who was the director of the Kunstverein, had written prolifically and recently on the Bauhaus, no doubt helping to sustain this somewhat forced comparison.

<sup>35</sup> Elizabeth Goldring, "Otto Piene and the Center for Advanced Visual Studies," in Ante Glibota, ed., *Otto Piene* (SI: Delight Ed, 2011), 309.

Piense's support of technology, however, was not unalloyed: his tenure marked a more skeptical and critical relationship to technology in general, and specifically to MIT as an adjunct of the American military-industrial complex, a view sharpened by the Vietnam War. Following his own experience in World War II, Piense was a committed pacifist, and vigorously refused defense spending to fund CAVS work, a position which would differentiate his program from the Architecture Machine Group and nascent Media Lab.<sup>36</sup> He believed that the collaboration in evidence during wartime should instead be put toward peaceful, creative ends: "Why do we not pool all human intelligence with the same security that accompanies its efforts in time of war and explode all the atom bombs in the world for the pleasure of the thing, a great display of human inventiveness in praise of human freedom?"<sup>37</sup> Laura Blacklow recalls that Cooper also proudly proclaimed, in the late 1970s, that she never took military money for her research, but it was neither as strongly held a position as Piense's nor, strictly speaking, accurate.<sup>38</sup>

Indeed, Piense brought a heavy dose of utopianism with him to MIT, along with his large-scale art events. Already in his 1961 essay, "Paths to Paradise," published in the third issue of *Zero*, he began with the epigraph "Yes, I dream of a better world./ Should I dream of a worse?/ Yes, I desire a wider world./ Should I desire a narrower?" He continued: "Utopias with a real basis are not Utopias. My utopia has a solid foundation: light, smoke, and 12 searchlights!"<sup>39</sup> These dematerialized media played a part in Piense's "sky art," the term for his environmental

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<sup>36</sup> See Matthew Wisnioski, "Centerbeam: Art of the Environment," and Wisnioski and Otto Piense, "Art/Science/Technology," both in *A Second Modernism: MIT, Architecture and the 'Techno-Social' Moment*, Arindam Dutta, ed. (Cambridge, MA: MIT Press, 2013), 189-225 and 770-798, respectively.

<sup>37</sup> Peter Weibel, Andreas Beutin, and Philipp Ziegler, eds., *Otto Piense: Energiefelder* (Nuremberg and Karlsruhe: Verlag für moderne Kunst and ZKM (Zentrum für Kunst und Medientechnologie Karlsruhe), 2013), 71.

<sup>38</sup> Blacklow, interview. The question of research funding is taken up in the next chapter.

<sup>39</sup> Reprinted in Weibel, Beutin, and Ziegler, *Otto Piense*, 71.

works that the artist coined in 1969. Piene elaborated on this thinking in *More Sky*, first published by the small press he created for the purpose in 1970, and then in a color edition by the MIT Press in 1973.<sup>40</sup> Piene's largest "sky art" event was held in 1980, with broad participation across MIT. *Centerbeam* appeared in Kassel, Germany for documenta 6, and then on the National Mall in Washington, D.C. The work comprised a large beam of light as well as steam, fog, lasers, neon, and holograms. The team behind it included 15 artists, five engineers, and five scientists, all from MIT. *Centerbeam* was made possible by sponsorship from the National Endowment for the Arts and material contributions from various corporations. The participants ranged from architecture professor Edward Allen (two of whose books Cooper designed), as a consultant on structural design; Stephen Benton, later of the Media Lab, as a consultant on holography; the video artist Betsy Connors; the artist Paul Earls, working with lasers; the renowned electrical engineer-turned-photographer Harold Edgerton, in charge of stroboscopic light; and Walter Lewin, a nuclear physicist, who developed a solar tracking system for the work. The spirit of the project suffused MIT's arts activities at the time: *Centerbeam*, as Piene described it, was "a metaphor for the community of volunteers forming daily symbioses (the relationships of a democratic society)...."<sup>41</sup> "*Centerbeam*," Piene wrote, "is an artist model for collaboration among artists, scientists and engineers who, working together, energize and sensitize fellow minds in a given environment. Sharing experiences, i.e., intensified, sublime communication among many, is the intention; this time, it is taking the form, language and complex expression of *Centerbeam*."<sup>42</sup>

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<sup>40</sup> Piene established Migrant Apparition Inc. in Cambridge to publish *More Sky* and *Rainbows*.

<sup>41</sup> Piene and Goldring, *Centerbeam*, 20.

<sup>42</sup> *Ibid.*, 24.

This collaborative spirit animated arts events on MIT's campus, and included the VLW. CAVS events were often advertised with posters of Piene's rough, illustrative design, printed at the Visible Language Workshop (fig. 3.7). The *Weather* exhibition of 1973, for example, which filled the lobby of building 7, included a cast of many dozens from across MIT, contributing poetry, sound installations, kinetic sculpture, and so on; the flamboyant posters read "idea and design by Otto Piene," and "printed by Ronald MacNeil." For the first exhibition of CAVS fellows' work in 1974, *Asterisk*, Piene also designed the poster, showing the names of the artists radiating around a boldly drawn asterisk at the center of the orange sheet (fig. 3.8); the show included Paul Earls, Stan VanDerBeek, Friedrich St. Florian, and other internationally significant artists. This poster was also printed at the VLW, and VLW students partook, officially or not, in many CAVS events.

CAVS artists also shaped the creative culture of which Cooper was a part, whether or not they collaborated directly with her. VanDerBeek, for example, was invited by Kepes to be one of the first artists in residence at CAVS, in 1969. As Gloria Sutton has argued of VanDerBeek's seminal *Movie-Drome*, his project of multi-projector, spherical theaters to be networked for the real-time transmission of images: "VanDerBeek's emphasis on two-way communication and data transfer introduced a telecommunications model for art production reflecting the larger transformation from a mechanical to an information age."<sup>43</sup> VanDerBeek's participation in Expanded Cinema, which Sutton describes as "artworks that employed multiple audio and visual projection sources in an intimate environment" was in keeping with Cooper's interest in simultaneous, multimedia experiences—and the eventual move toward the metamedium of the

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<sup>43</sup> Gloria Sutton, *The Experience Machine: Stan VanderBeek's Movie-Drome and Expanded Cinema* (Cambridge, MA: MIT Press, 2015), 1.

computer—as well as the immersive environments that functioned as interfaces in Cooper’s later work. Sutton argues that “VanDerBeek’s *Movie-Drome* should be read as neither a film-specific medium nor a type of technology, but rather as an apparatus that functioned as a means and place for interaction: an interface, a term introduced by Marshall McLuhan in 1962.”<sup>44</sup> She goes on to define the interface, productively, as “an apparatus designed to connect two different or distinct systems so they can be operated jointly, thus generating a point of exchange.” Interfaces, then, were a topic of discussion in many quarters of MIT at this time.

An example of Cooper’s intersection with different technologies of networked image transmission is the double self-portrait preserved in her papers (fig. 3.9). David Reinfurt has described this object’s multiple layers of mediation and loops of feedback in meticulous detail, capturing its significance as an artefact of the time- and process-based explorations then taking place at MIT.<sup>45</sup> The stacked images show Cooper at two points in the process of making a photograph with a Polaroid SX-70 camera, the first as the flashbulb fires, the second as the picture emerges from the camera. This action was recorded using another recently available, portable, instant-capture device, a black-and-white, battery powered Portapak video camera. Reinfurt expands on the essential gap between the two images:

Between the first and second frames, an instant photograph emerges from the camera. The image captured in its chemical sandwich will develop in the next sixty seconds. Meanwhile, Cooper stares directly back at the Portapak video camera, one eye given to her SX-70. She is a cyborg—her left eye replaced and upgraded by the Polaroid lens. The undeveloped photograph coming out of her camera is a record of what she sees, and soon it will reveal the Portapak, its operator, and the surrounding context. For now, that picture remains blank.<sup>46</sup>

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<sup>44</sup> Ibid., 14. This and following quotation. Sutton is referring to Marshall McLuhan, *The Gutenberg Galaxy: The Making of Typographic Man* (Toronto: University of Toronto Press, 1962).

<sup>45</sup> David Reinfurt, “Soft Copy (1974–1994),” in David Reinfurt and Robert Wiesenberger, *Muriel Cooper* (Cambridge, MA: MIT Press, 2017), 19–22.

<sup>46</sup> Ibid., 20.

The other important gap in time here is much longer, almost a decade, between the capture of these two images and their being printed together. The images were output from video via slow-scan television (SSTV), a technology capable of transmitting images as audio signals over telephone line. Artists in CAVS, such as Aldo Tambellini and Bernd Kracke, and Lee Silverman in the VLW, experimented with slow-scan, as at the “Artists’ Use of Telecommunications” conference in 1980, organized by the San Francisco Museum of Modern Art, in which participants transmitted images back and forth around the world. The two images of Cooper were displayed on two stacked monitors, and captured by a large-format (20 x 24”) Polaroid camera. As Reinfurt writes, “The resulting double self-portrait is a remarkably resonant image. Cooper is caught somewhere in between the original image, its transmission, and the transmission’s reproduction.”<sup>47</sup> Several large-format Polaroid prints by students, transmitted via slow-scan, survive in Cooper’s papers (fig. 3.10).

At least early on, the VLW was presented as a studio that could serve various artists at MIT. In a grant to the National Endowment for the Arts, photography instructor Jonathan Green wrote:

The Visible Language Workshop provides a place within MIT where practicing professional artists who are now a part of the MIT community or who become artists-in-residence can test their ideas and pursue their own personal work.

... a grant from the NEA would allow professional artists to practice at the VLW, substantially advancing their own work and actively nourishing MIT’s blossoming concern with the arts.<sup>48</sup>

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<sup>47</sup> Ibid., 22.

<sup>48</sup> Memorandum from Jonathan Green to Otto Piene, Muriel Cooper, Ron MacNeil, “Grant Application to the National Endowment for the Arts for the Visible Language Workshop,” October 3, 1974. Cooper Records, box 4.



Green addressed his draft to Cooper and MacNeil, as well as Piene, writing: “In order for this application to qualify it must be submitted with biographies of the artists involved in the workshop....” The degree to which this conception of the VLW as a shared studio space was accurate, or whether it was instead presented to garner funding, is debatable. In 1978, VLW instructor Peter Droege sketched out the overlapping arts and media practices in the Department of Architecture, in terms of their interests and resource uses, in tabular form (fig. 3.11).<sup>49</sup> At this point it was clear that multiple programs worked in each medium, with two each under both “Photography” and “Video and Film.” The VLW alone occupies “Printed Media,” and the Architecture Machine Group “Computer Graphics,” though by the next year, the VLW would clearly occupy the latter space as well. These multiple arts programs within the Department of Architecture, all founded in the late 1960s or mid-1970s, would, by 1979, be loosely constellated in a masters program in the arts. Piene, along with Negroponte and the documentary filmmaker Richard Leacock, helped design the interdisciplinary degree program within the Department of Architecture.

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<sup>49</sup> Peter Droege, “Media Resources, 2<sup>nd</sup> draft August 13, 1978,” Cooper Records, box 4.

## Master of Science in Visual Studies

The Department of Architecture's Master of Science in Visual Studies (MSVS) described itself as "a graduate degree program embracing both the creative and technical aspects of image making."<sup>50</sup> It was also deemed "an experimental program." The MSVS program, which required four semesters plus a thesis, linked five existing arts-related programs—the Film and Video Section, the Architecture Machine Group, the Visible Language Workshop, the Creative Photography Lab, and the Center for Advanced Visual Studies. It presented these as five concentrations, respectively: Film/Video, Computers, Graphics, Photography, and Environmental Art. Crossover between these areas, program literature explained, was encouraged. Moreover, the MSVS set the stage for a larger initiative: "It is expected," the literature read, "that both these and new areas will evolve within the framework of a proposed Arts and Media Technology facility"—in other words, what would become the MIT Media Lab.

The Film/Video section, established in 1969 and directed by Ricky Leacock, worked from a *cinema verité* tradition of unscripted filmmaking from a handheld camera. This was based on Leacock's own work, and it generally produced social documentary and diaristic films. The program had also, in its decade run, invented some new filmmaking technologies, such as the "sync sound Super 8 system." Leacock's section was also engaged, program literature noted, in developing the possibilities of "interactive movies" using optical videodisc, a persistent interest of the Architecture Machine Group that would be developed at the Media Lab. The Architecture Machine Group's Aspen Movie Map, for example, developed in the late 1970s with funding from DARPA, remains a seminal example of an immersive simulation conceived in cinematic

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<sup>50</sup> Massachusetts Institute of Technology, Department of Architecture, Master of Science in Visual Studies (program flier), 1979, Cooper Collection, 12-284. This and quotations on following two pages.

terms. As Felicity Scott has written, “the project stands not only as a landmark in the history of so-called virtual space, and quite literally as a precursor to contemporary paradigms of spatially managed data and interactivity via computer interfaces, but also as a key example of the increasingly militarized nature of their operative representations of ‘place.’”<sup>51</sup>

“Computers,” the area of study directed by Negroponte, was broadly titled to supersede the earlier emphasis on “Computer graphics,” and instead include “other forms of communication which might be found at the human to computer interface.... [t]his includes voice recognition and synthesis, eye-tracking and body sensing, tactile interfaces, and large format graphic displays.” The logic that would undergird the Media Lab was already presented here in capsule form: “A confluence is seen in the merging of previously separate disciplines: computer graphics, image processing, and broadcast television, with a common denominator in digital television.” This concentration used the well-equipped facilities, and well-established model of sponsored research, employed by the Architecture Machine Group.

Cooper’s group, “Graphics,” operated from the Visible Language Workshop, which likewise included its own computer graphics capabilities. “Graduate study is individually based,” read the program description: “Innovative and substantive visual/verbal communication and the development of new and enabling tools are the primary concerns. Students have come from such disciplines as graphic design, printmaking, photography, computers, and writing.”

The Photography division, “Creative Photography,” the descendent of the program started by Minor White and assisted by Ron MacNeil, was led by Starr Ockenga. While the program was “grounded in the solid tradition of the production and study of the silver print, the single photographic image,” it also supported “the widest range of investigation and research into

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<sup>51</sup> Felicity D. Scott, “Dataland (and Its Ghosts): Aspen Proving Grounds,” in *The Aspen Complex*, ed. Martin Beck (Berlin: Sternberg Press, 2012), 159.

the photographic medium... [with] interdisciplinary activities extending into other camera-produced activity, such as film, video, graphics, or computer graphics.” In other words, this division, like the others, was amenable to and perhaps oriented toward—at least as presented here—a digital future.

Piene’s “Environmental Art” concentration was housed in the Center for Advanced Visual Studies, and benefited from its strong roster of visiting fellows for teaching. “Among the primary fields of specific interest to CAVS are environmental sculpture and painting, and sculptural architecture of all scales; public leisure installations; celebrations; elemental kinetic art and aesthetic/psychological ecology.... Further disciplines of art and art research pursued by fellows of CAVS have become, consequently, and with increasing emphasis, developmental media work—especially progressive video art—and new forms of kinetic art, such as holography, laser research and multi-modal performance.”

### **Creative Seeing**

The wide breadth of arts practices at MIT was also made accessible to undergraduates at MIT through a humanities distribution course Cooper coordinated, starting around 1979, called Creative Seeing. “In the absence of an ‘art historian’ within the department of architecture,” Cooper explained, “I have agreed to teach and coordinate Creative Seeing— one of the department’s humanities distribution subjects.”<sup>52</sup> These large freshman courses combined historical slide lectures and readings with hands-on experience. For Cooper, the course was a chance to present the multimedia arts practices emerging at MIT, especially on the graduate

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<sup>52</sup> Muriel Cooper, undated draft letter, Cooper Collection, 12-272.

level, in microcosm: “It is an interesting challenge for the design of a learning experience, and an opportunity to probe some of the issues which are implicit in the growing MSVS program at a point where biases have not yet hardened.”<sup>53</sup>

In a memo to the committee on the humanities distribution, Cooper presented the course, within the context of MIT’s mission, as follows:

Creative Seeing (4.901) is an introduction to visual literacy and to the visual arts at MIT (graphics, computers, photography, film, video, environmental art and history). While the primary context is a hands-on studio or workshop environment it is dedicated to the principle of *Mens et Manus*.

She also found herself justifying an arts course, in general, at MIT:

An introduction to art in a great technological institution does not function simply as a humane antidote to the pursuit of science. Art and communication have historically been symbiotically related to technology. There is much evidence of the underlying similarities of creativity in art and scientific thought....<sup>54</sup>

The idea of the course, of mixing thinking and making, was not itself novel in art education, as Cooper conceded in the memo. But: “What is new I believe is that... we have the opportunity to explore the new issues growing particularly out of the dematerialized nature of the computer/electronic at a point in the education process which is pivotal.” Crucially, she observed in conclusion: “An examination of the history of art in the 20<sup>th</sup> century reveals an accelerated dialogue between art and technology. The relationships of the visual arts to science and technology at MIT can be seen as a model of one of the major social and cultural issues of our time. Creative Seeing presents a unique opportunity for exploring those relationships at an important time in a student’s education.”

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<sup>53</sup> Ibid.

<sup>54</sup> Muriel Cooper, Memorandum to Irwin Oppenheim, March 6, 1980, Cooper Records, box 3.

The course offers further insight into Cooper's teaching of and with media. A section of the memo bore the heading "Use of Media as an Educational Tool":

While the media we deal with in this class are intrinsic art and communication forms, their characteristics also offer interesting educational opportunities. For example, the instant feedback of Polaroid images, video tapes or slide generation and projection provide the student and group with a kind of distancing or objectivity which was only provided in the past by time. Such feedback can accelerate learning and promote understanding.

Cooper co-taught the course with Laura Blacklow, who came to MIT after completing a masters degree at the University of Rochester, where she had focused on artist bookmaking and historical photography techniques. Students met both altogether, for Cooper's large presentations, and in three smaller groups, led by the TAs, for workshops, discussions, and feedback. Students were required to "keep an ongoing visual/verbal journal" for the class, to do required readings, and to write formal papers. On the first day, students made an SX-70 Polaroid portrait of themselves, filled out a questionnaire about their background and interests, and then expanded this into a profile in their journals (fig. 3.12).

As a survey of the arts at MIT, class sections included visits to the Architecture Machine Group; sessions on visual design and print at the Visible Language Workshop; a section on "Photography, Film, and Video"; a visit to the Creative Photography Laboratory; and a visit to the Center for Advanced Visual Studies. For the VLW section, students circulated around various stations, with VLW staff and TAs, some of them former students, introducing various techniques: Blacklow discussed bookbinding, Joel Slayton and Rob Haimes the offset press, Gini Holmes the 3M copier, Rob Faught and Dan Franzblau computer graphics, and Nancy Gardner the process camera. One assignment was to create a film journal using Polaroid Polavision Land cameras (the nearby Polaroid Corporation had donated twelve of these lightweight, handheld, trigger-based cameras capable of shooting a little over two minutes of film onto cassettes). The

Photography, Film, and Video section ended with the students broadcasting their own productions over MIT's cable television network.

Student assignments, both in the studio and in the form of written assignments, reflected many of Cooper's persistent interests. Students were encouraged to think about different kinds of images, whether single or multiple, original or reproduction, and static or time-based. One early assignment involved creating a book together as a class, with each student contributing two pages. These were then transferred to acetate in order to make plates so the book could be printed on the VLW's offset press. Cooper explained:

The first page should be an encapsulated visual/verbal presentation of what has happened in your personal life since you first started participating in Creative Seeing. Your journal can be a prime source of materials.... The second page should be an encapsulation of what has been happening in the outside world in that same period of time. The material should be gathered from news channels—papers, magazines, radio or television. Where, when and whether there is a relationship between these two is something only you can decide—preferably on these pages.<sup>55</sup>

After this book-making session, students visited the Architecture Machine Group. To contextualize these two experiences in relation to one another, Cooper's handout offered an important glimpse into her thinking about the book as a unique kind of information technology.

The handout read:

Tonight, we will look at the books you created from multiple prints at the VLW. You will see how, with similar resource materials (the printed sheets), each one of you changed the appearance and meaning of images when you sequenced and compiled these materials into book form. Single images join each other in a physical time-space framework which affects the viewers' psychological time framework. Although the pages are fixed by the binding, you can meander through a book, accessing the pages randomly. Print in its many physical forms has real-time and sensory characteristics. It is a major way of extending one's physical presence and ideas. Print technologies provide a way of preserving and disseminating memory.

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<sup>55</sup> "Creative Seeing, 4<sup>th</sup> Assignment," n.d., Cooper Records, box 3.

When we visit the Architecture Machine we will see some of the ways in which computers and video change and enhance our means of perceiving, assessing and ordering our environment. Space, time, memory and motion take on another dimension.<sup>56</sup>

As an introduction to this latter session, Cooper began with a presentation titled “Production, Reproduction, and Simulation.” The title, a mashup of Moholy-Nagy’s *Painting, Photography, Film*, and an entry in it, “Production-Reproduction,” suggested both the use of reproductive tools toward productive ends, as Moholy called for, as well, perhaps, as the march of progress implied by his title, here enabled by computers, from the individual object, to its multiple form, and finally to its representation on-screen.

Course readings, almost half of them MIT Press publications Cooper had worked on, likewise highlighted her interests. Walter Benjamin’s famous “artwork” essay figured prominently at the start of most syllabi, as did John Berger’s *Ways of Seeing*, itself at least in part a gloss on Benjamin. Cooper’s own formation through the thinking of postwar émigrés indebted to Gestalt psychology was evident in the inclusion of Rudolf Arnheim’s *Visual Thinking* and Kepes’s *Language of Vision*, but the syllabus also included her contemporaries, Donis Dondis and Otto Piene. Students were recommended to consult collections of essays by John Cage and Marshall McLuhan. A section on photography listed Susan Sontag and Beaumont Newhall on the subject; one for “Language and Typography” listed texts by Moholy-Nagy, Jan Tschichold, and Karl Gerstner; and a relatively sparser section, on “Computers and Simulation,” included excerpts from Alvin Toffler’s 1970 book *Future Shock*, and Negroponte’s essay “The Return of the Sunday Painter,” which predicted, rather accurately, that the increasing processing power, intuitive usability, and expressive potential of computers, combined with their decreasing size

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<sup>56</sup> “Creative Seeing, October 7, 1980: Computers: The Architecture Machine,” Cooper Records, box 3.



and price, would allow people of all ages and backgrounds to pursue digitally based creative pursuits as a matter of recreation.

The final project/class in Creative Seeing was listed as “a participatory celebration.” For the lecture anticipating this final celebration, Cooper showed slides of various kinds of celebrations, culled from MIT’s Rotch Library, including a 1967 “love-in” and 1971 anti-war protests, both in Venice Beach, California; carnival in Rio; various Hindu wedding customs, amusement parks, Renaissance fairs, the Atlantic City boardwalk, and late 1960s works by Alexander Calder, Christo, and Les Levine. As Cooper noted, summarizing the students’ earlier visit to CAVS, to learn about *Centerbeam*: “CAVS sees celebration as a profound element in our individual and societal psyches. The Fellows seek to maintain a human balance and they use some experimental technology to implement their means.”<sup>57</sup> As a broader observation, she ventured: “The principles of celebration and involvement are ones which have been lost for the most part since the industrial revolution— yet they are of profound importance to our psyches individually and socially. Artists seek to maintain human balance— their means vary from time to time.”<sup>58</sup> Following this section at CAVS, and clearly influenced by the celebratory, interdisciplinary environments and events Piene created, was “the Last Supper” (the assigned reading for this last session was Piene’s *More Sky*). Cooper explained the event as follows:

Each section will be responsible for an imaginative ceremonial meal such as a birthday party. Each group should establish a theme that will work for them and invite the other two groups to their party, i.e., eat or partake three times. You may want to take food on as art both in a photographic/graphic presentation and in real edible artworks. Food is sustenance in both a physical and emotional way. How aware are we, though, of the ritual, aesthetic and creative aspects of food? Think about other senses such as sound? Could you program an entire meal based on smells alone? What about the environment? Banners, balloons, streamers? What about lighting in order to reinforce the aesthetic environment? Can you

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<sup>57</sup> “Creative Seeing, December 2, 1980,” Cooper Records, box 3. Given her interests, it would be surprising if Cooper had not also discussed celebrations at the Bauhaus for their institutional and creative significance.

<sup>58</sup> “Creative Seeing, 10th meeting, April 29, 1980,” Cooper Records, box 3.

create aesthetically interesting as well as functional eating utensils or serving platters? What about a diazo table cloth? Or personalized and creative gifts or wrappings? The best parties or social experiences are ones in which everyone is involved and the line between audience and presenter is continuously shifting. In what ways can you involve your guests— your class-mates? Face painting, costumes, masks?<sup>59</sup>

Collaborative, participatory, multimedia, and immersive, this culminating event invited students both to practice what they had learned and to celebrate the end of the course; as with most of Cooper’s teaching, it was a lesson disguised as an open-ended, potentially raucous, activity.

### **Summer Sessions**

Starting in 1979, the VLW began offering a summer course to designers, design managers, and design educators from across the country. A bifold pamphlet, evolved from the format Cooper first worked out some 25 years earlier to advertise others’ courses, now described her own, titled “Graphic Design: Computers and Other Tools,” with the subtitle: “Advanced Workshop in Design and Typography” (fig. 3.13). The description inside explained that the program was premised on “a healthy balance between practice and experiment,” given the changing landscape of the design profession:

For example, the proliferation of in-house publication centers has been made possible by word-processing and inexpensive composition devices, duplicating and reproducing print systems, and computer systems capable of graphics. These in-house systems have serious ramifications for cost control, scheduling, and the roles of non-specialists, designers, and clients, and bring into question traditional modes of print communication design, production and consumption.<sup>60</sup>

Attendees were drawn by Cooper’s reputation—established by her award-winning publications at the Press, and advanced by the cutting-edge research of the VLW—and surely also by the

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<sup>59</sup> Ibid.

<sup>60</sup> Pamphlet for “Graphic Design: Computers and Other Tools,” July 30–August 3, 1979, Cooper Collection, 12-284.

prestige of MIT. Yet they were also no doubt propelled by uncertainty concerning the future of their professions, and the prospect of their own redundancy in the face of new, powerful, and widely available design software. As Blacklow put it: “Graphic designers were *so scared*. ‘We won’t have any jobs!’”

Cooper “got *top* designers” for the sessions, Blacklow recalls. Attendees came from corporations like IBM and Xerox as well as Boeing, Raytheon, and Texas Instruments; radio and TV stations, and publishers like McGraw Hill, Time-Life; and from universities and art schools. The program included visits to the Visible Language Workshop for demonstrations of computer graphics, electrographics, and large format Polaroid output; to the Architecture Machine Group for demonstrations of its user interface research, including tactile input and voice control; and tours of MacNeil’s image processing software for color separation, computerized plate making, and digital output. Attendees also visited the MIT Press’s new Computergraphics text editing and composition system. Participants worked on individual and group projects over the course of the session. These were presented at the end before a group of critics that included MIT Design Services staff past and present, such as Casey, Coburn, and Winkler; the RISD professor Tom Ockersee; Boston designer Carl Zahn, WGBH’s design director Chris Pullman, and the designer Lou Danziger of Cal Arts.

The lectures and sessions held form a telling snapshot of the state of technology, and anxiety, in the publishing industry. Lectures were given on graphic design history by the designer Keith Goddard, whose account was fittingly techno-determinist, and urged further experimentation. Steven Gregory, of the Architecture Machine Group, spoke about computer graphics— namely the distinction between vector and raster scan displays, and a “paint” software program developed in-house on a frame buffer raster scan display. He also discussed

the storage and retrieval possibilities of videodiscs, and their role in the Spatial Data Management System (SDMS), with its multimodal interface. Gregory took pains to explain the funding sources of the AMG, but also its commitment to openness:

The Architecture Machine Demo Lab teaches students how to use technology interactively. Its major funding was at one time from NSF. Now, it is primarily funded by the Advanced Research Project Agency (ARPA) which is an agency in the Department of Defense. ARPA's task is to disseminate information about these new technologies to both government agencies and private industry— to whomever is interested. At the Architecture Machine lab [sic.] they show information to training groups, private companies, etc. Their work is public information, as is all research at MIT.

Patty Seybold, a Boston-based technology consultant for the publishing industry, spoke about computer composition through interactive terminals, distinguishing between “the composition of form and the composition of content”; that is, that most computer typesetters focus only on the latter. She distinguished between different manufacturers' technologies, and some of the publications that use them, at a time when the ability to see both content and form, with a “what you see is what you get” (WYSIWYG) interface, was rare. She likewise explained the various, rather cumbersome, modes of input.<sup>61</sup>

Cooper worked hard to garner loans of the latest technologies for the sessions, and it seems fortuitous that many of the nation's leading print technology companies were based in the Boston area, making them likelier to be familiar with Cooper's program, and in a better position, logistically, to lend materials and visit the VLW. Cooper wrote to Polaroid, for example, to thank them for lending material to the summer session program, to explain its use, and to make a pitch for early access to the company's newest products:

The workshop sessions will be devoted to the production of instant conference proceedings designed and printed from computer-based words and images and from one-of-a-kind image technologies.... The opportunity to work with Polaroid equipment and material not only enriches the entire spectrum, but provides instant feedback and a quality of hardcopy available in no other medium.... If there is another inevitable beyond death and taxes, it is

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<sup>61</sup> “Summer Session 1979, Précis of Lectures and Demonstrations,” Cooper Records, box 2.

that you can never have enough Polaroid film. We have heard rumors about experimental film and this would be an interesting opportunity to [do] some special ‘market research’ with this group.<sup>62</sup>

She sent a nearly identical letter to Mergenthaler Linotype, in nearby Woburn, Massachusetts, to thank them for loaning a “CRTronic” typesetter, the latest desktop phototypesetting machine that included a CRT display.<sup>63</sup> VLW summer sessions continued through 1983, by which time the session was tellingly named “The New Graphics: A Computer Workshop in Visual Communication.” This time the session also included an “Apple graphics Workshop.”

### **Words, Images, Tools, and Ideas**

In 1980, Cooper was asked by the MIT School of Architecture and Planning’s journal *Plan* to submit an article on the work of the VLW. She ultimately responded with an eleven-page visual essay titled “Words, Images, Tools and Ideas.”<sup>64</sup> Interrupting the elegant three-column grid and sans serif typography of the magazine, designed by Ralph Coburn, Cooper began her contribution by reproducing a letter to the editor, rather crudely typewritten on VLW letterhead (also by Coburn) (fig. 3.14). This was at once at once a cover letter and a manifesto—one of the few programmatic texts Cooper published. Addressed to editor Jeffrey Cruikshank, it began: “When you asked me to prepare an article for *Plan*, I set myself the task of producing a ‘graphic’ article which would represent the ideas and concerns of the Visible Language Workshop by

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<sup>62</sup> Muriel Cooper to Bob Roden, June 23, 1980, Cooper Records, box 2.

<sup>63</sup> Muriel Cooper to William O’Connell, June 19, 1980, Cooper Records, box 2. ITEK, another company based in the Boston area (Waltham), was also convinced to lend material to Cooper’s summer session.

<sup>64</sup> The article borrowed its title from an introductory graphics course in the VLW, taught by Peter Droege and Joel Slayton in the spring of 1980, titled “Words, Images, Graphics Tools, and Ideas.” It billed itself as “an introduction to the spectrum of graphics ideas and tools available at the Visible Language Workshop in communication, print, and computer graphics.” Visible Language Workshop course listings, Spring 1980, Cooper Collection, 12-284.

virtue of its form as well as its content.” As a kind of thesis, Cooper argued for the article’s own medium, of print, as a possible prototype for some of the new relationships computing would allow, both between media and between people.:

In a computer electronic age we see print communication as a model of changing user/maker relationships and the workshop as a place in which the content, quality and technology of communication inform each other in education, professional and research programs.<sup>65</sup>

The article that followed, Cooper announced, in a brief that also summed up her work to that point, and her ambitions going forward, “would try to fulfill the following criteria”:

1. It would make use of the tools, processes and technologies of graphic arts media as directly as possible and the tools would be integrated with concept and product. ...
2. The author would be the maker contrary to the specialization mode which makes the author of the content the author, the author of the form the designer, and the author of the craft the typographer/printer.
3. Visual and verbal representation of the ideas would be synthesized rather than separate.
4. Time would remain as fluid and immediate as possible, leaving room for feedback and change.

In a draft of the letter, she hinted at what would become this fourth point by jotting in the margin: “keep it as fluid as possible until the last possible moment.” (fig. 3.15)<sup>66</sup> The limit case for this just-in-time fluidity, or even the indefinite life of “soft copy” on screen, would of course be the computer, to which Cooper would dedicate herself in the next chapter of her career.

The letter concludes by noting the collaborative nature of the piece, and Cooper’s work as a whole: “Much of the material [to follow] was developed together with Professor Ron MacNeil and the VLW staff.” The final two statements of the paragraph are somewhat

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<sup>65</sup> Muriel Cooper and Visible Language Workshop, “Words, Images, Tools and Ideas,” *Plan: Review of the MIT School of Architecture and Planning*, 1980, 1.

<sup>66</sup> Muriel Cooper, Draft letter for *Plan* article, n.d., Cooper Collection, 12-284.

ambiguous in their referents: “It,” Cooper writes, probably referring to the making of the article that follows, “has been a fascinating opportunity which has elucidated many of the complexities of authorship into print.” Precisely what this means is unclear: the complexities of authorship—who made what, and how, given telescoping levels of source material, citation, mediation, and so on—are on display in the piece, whether or not they are made clear to the reader—though perhaps just this ambiguity is the point. The next sentence, no less ambiguous, observes: “There is still no magic way— but we propose to keep working at it.” Magic way to what, one might ask. Yet Cooper’s draft of the letter may offer some clarity, and a self-critique: “Well I haven’t succeeded as easily as I thought I might there is as yet no magic way to print.”<sup>67</sup> This admission of difficulty shows both the persistent technological frictions that frustrated Cooper throughout her career, and the long-range attempt, surely shared by many at the Institute, to realize Arthur C. Clarke’s well-known adage that “Any sufficiently advanced technology is indistinguishable from magic.”<sup>68</sup> The proposal “to keep working on it” extends beyond this letter, written at the threshold of a new chapter in Cooper’s work, and indeed beyond her own lifetime. The final statement, on its own line, is a bold promise: “This stands as a sketch for the future.”

The facing page, and the five double-page spreads that follow, photographically represent the work of the VLW, its people, its tools, and its influences, in a messy collage aesthetic (fig. 3.16). Throughout, one sees photographic outputs of large and small serified lettering rendered smoothly on screen, thanks to anti-aliasing techniques; slides litter the frame, of historic typography, from constructed Renaissance letterforms to early Bauhaus, expressionist party

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<sup>67</sup> This sentence is a run-on in the original; the second clause might be intended to explain the first.

<sup>68</sup> Arthur C. Clarke, “Hazards of Prophecy: The Failure of Imagination,” in *Profiles of the Future: An Inquiry into the Limits of the Possible* (New York: Popular Library, 1973).

invitations, to the cacophony of Italian Futurist typography, to a photograph of Cooper's own design for the MIT Press colophon. Slides and Polaroid output of the Mona Lisa, defaced with a neo-Duchampian, digital mustache, are overlaid on a photograph of a hand atop the pixelated abstraction of a screen. A mini-portfolio of VLW work in the form of slides appears on a light table—showing works ranging from Cooper's poster for Messages and Means, to MacNeil's photography, to student works in progress. The article is about the VLW, and indeed the process of the article's own making: The light table is overlaid by a pencil, scissors, ruler, and the radial measuring device known as a proportional scale, used to measure the number of times of reduction or enlargement for photographs.

It is a composite image akin in some ways to Herbert Bayer's self-reflexive, programmatic cover for the Bauhaus magazine in 1928 (fig. 3.17), in which a photomontaged, trompe l'oeil still-life brings together a gently folded issue of the publication itself, geometric plaster blocks used in the school's sculpture workshop, and the tools of Bayer's own trade—both a pencil and the triangle used to construct the ubiquitous right angles of Bauhaus design.<sup>69</sup> This picture, also about the process of its own making (though less self-reflexive than some Dada montage, which might have included the scissors itself, and the jagged and disjunctive edges of the combined elements), in its totality reveals a perceptual interest in transparency and opacity, volume and flatness, reality and representation, all consistent with the formal concerns dominant

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<sup>69</sup> Of this design, Bayer's biographer Arthur Cohen wrote: "But the most original employment of a photograph was Bayer's photomontage for the cover of the *bauhaus zeitschrift* (no. 1, 1928)... Not only has the periodical and its subject matter been identified, virtually without words, but the entire message—the Bauhaus and its educational program—has been communicated." See Arthur Cohen, *Herbert Bayer: The Complete Work* (Cambridge: MIT Press, 1984), 202. Another programmatic image in this category might be El Lissitzky's 1924 photomontage self-portrait (commonly known as *The Constructor*). More than Bayer's later image, this one foregrounds its own constructed nature while also showing a tool of the constructor's trade (a compass), and directly connecting eye and hand through superimposition and double-exposure (a trope Bayer would pick up, to different effect, in surrealist photographs like *The Lonely Metropolitan*, of 1932).



at the Bauhaus. Likewise, Cooper's composition plays with the reproduction and re-presentation of images while also bringing together multiple, heterogeneous images in a single frame, perhaps prototyping the kind of "metamedium," to use computer scientist Alan Kay's term, that software would provide.<sup>70</sup> While the effect of Cooper's article was static rather than animated, purely visual rather than sonic or haptic, and in black and white rather than dazzling color, the spreads of *Plan* were as much a portfolio piece as a prototype, using print and photography to project forward the possibilities of computing.

How all of this might relate to the discipline of architecture was discussed in the introduction to the magazine. This special issue of *Plan*, which proposed to look back on 20 years in MIT's School of Architecture and Planning, began with an introduction by the Dean, William Porter. Reviewing this period, he wrote:

By 1970, a decade of social ferment had challenged the nation's sense of stability. Our professions had not been spared. Architecture and planning as practiced and taught were questioned for their relevance to pressing social problems, for their accessibility to many groups in need of services, and for their openness to change. The ensuing decade was marked by the erosion of traditional boundaries, and by the emergence of new conditions within traditional fields. In response, the School sought new professional, social, and physical frameworks within which to shape new understandings of human potential. Our search has been guided by a commitment to the release of others' creativity through professional action, and to the service of communities that have lacked access to professional services.<sup>71</sup>

In response, the discipline had evolved: "Traditional design and planning skills began to combine with newer approaches designed to help people achieve their own objectives." Porter spoke of cooperation between professionals and clients, and an emphasis on mediation, as opposed to master planning, as being based on and responsive to both policy and prediction, and to a wider

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<sup>70</sup> See Alan Kay and Adele Goldberg, "Personal Dynamic Media" in: *Computer* 10(3), March 1977, 31–41.

<sup>71</sup> William Porter, "Frameworks," *Plan: Review of the MIT School of Architecture and Planning*, no. 11 (1980): 4.

group of stakeholders.<sup>72</sup> The vision expressed here was frankly abstract: negotiation, flexibility, responsiveness, political awareness had all come to the fore in architecture. Porter spoke of “plural visions,” a “wide spectrum of lives,” and “the potential of architecture as a mediator of human experience.” This last point suggested an expanded remit for the discipline, which he couched as being quite natural for the profession:

A new area of professional action is opening up in the realm of media, which have become an integral part of society’s everyday life. For a school concerned with the quality of the human environment, an extension of scope to include the media environment has been as natural as was the extension years ago from the physical to the social environment. In the School, the arts and media have merged through visual design, photography and video, and graphics. The technologies come from within those fields, from computer graphics, and from related research in the interaction between people and machines. Opportunities for communication with audiences at once wider and more specialized have appeared through cable television, inexpensive film-making, and specialized publishing. The opportunities are becoming further heightened as these media become more manipulable by and interactive with their users.<sup>73</sup>

This new interest within the school would be cemented by a proposal in the pages that followed.

### **Arts and Media Technology**

In an article entitled “Arts and Media Technology,” illustrated with architectural drawings and a model, Negroponte sketched out a plan for what would, in five years, open its doors as the MIT Media Lab (fig. 3.18).<sup>74</sup> “Arts and Media Technology,” Negroponte wrote, “is many things: it is

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<sup>72</sup> Ibid., 4.

<sup>73</sup> Ibid., 5.

<sup>74</sup> The pithy name “Media Lab” was apparently the coinage of John de Monchaux, then dean of the School of Architecture and Planning. The use of “media,” as opposed to “communications,” or the naming of more specific technologies or industries, was, according to Negroponte, strategic, “because so many people, departments, and labs at MIT were in the fields of computers or communications. Nobody claimed or wanted ‘media.’” See Margaret Evans, “Media Lab: What’s in the Name?,” September 7, 2017, <https://www.media.mit.edu/posts/whats-in-the-name/>. For a recent exploration of the idea of the laboratory within architecture culture, see “Lab Cult: An unorthodox history of interchanges between science and architecture,” an exhibition curated by Evangelos Kotsioris at the Canadian Centre for Architecture, Montreal, March 23–September 2, 2018. It includes case studies on both MIT’s Artificial Intelligence Lab and the Architecture Machine Group.

a style of thinking; it is new opportunities for teaching and research; it is a new building; and it is an assemblage of people and positions, new and existing, mostly from Architecture and Planning."<sup>75</sup> Under the heading “Art as the Science of Metaphor,” he continued:

MIT is encouraging a new discipline, which focuses on the qualities of communication as personal and societal events. The idea is to invent, develop, and merge the most advanced means of presentation and input with the qualitative and the subjective components of human-to-human and human-to-machine interactions. The plans are to combine six teaching and research programs, which have hitherto been satellite academic activities with more or less momentum, but without the critical mass necessary to coalesce into a coherent body of knowledge, with common purposes. Each group is engaged in various kinds of signal processing, with less emphasis on the pragmatic aspects of their focus and more on its qualitative, subjective, and artistic senses.

The groups Negro Ponte referred to were currently under the umbrella of the MSVS program. Yet this new proposal would mean uniting these areas, and formalizing their research activities: “[C]urrent plans for Arts and Media Technology at MIT are intended to create intersections of the most advanced research efforts in media, with applications of all sorts, from practical to poetic: in education, medicine, information processing, telecommunications, as well as the visual and performing arts. In this sense, arts are a style of thinking, question asking, and problem solving, as much as (or even more than) a form of introspection.” To the extent that the visual arts would become deemphasized in this new scheme, however, it seemed less about “art as the science of metaphor” and more about art as a metaphor or method for science.<sup>76</sup>

“Arts and media technology,” Negro Ponte argued, would situate itself at the intersection of three existing industries: motion pictures, print, and computing. Illustrated by three overlapping circles, Negro Ponte would use this diagram, which Cooper called his “teething

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<sup>75</sup> Nicholas Negro Ponte, “Arts and Media Technology,” *Plan: Review of the MIT School of Architecture and Planning*, no. 11 (1980): 19.

<sup>76</sup> See Matthew Wisnioski’s contributions to Arindam Dutta, ed., *A Second Modernism: MIT, Architecture, and the “Techno-Social” Moment* (Cambridge: MIT Press, 2013).

rings,” to diagnose a problem the Media Lab was meant to solve, and thereby to garner funding for it.<sup>77</sup> In short: shared technologies made possible these three areas, especially in an increasingly digital age, yet their training, industry standards, and evaluative criteria could not be more different. Moreover, the “existence of almost one hundred million color television sets, which have the potential to serve handsomely as personal and interactive ‘windows’ into a large number of information spaces,” Negroponte observed, enabled a shift from a one-to-many model of “common denominator” media, to an interactive and personalizable tool and medium in a world awash with vast quantities of rapidly changing information.<sup>78</sup> The criteria for these devices, Negroponte predicted accurately, would soon change: “The kind of question we will ask ourselves when sitting in front of a terminal is: does it feel good?”

Videodiscs were posited here as exemplary of the kinds of technologies in need of exploration. While it now seems premature to have observed that “videodisc technology is potentially as important as the invention of the Gutenberg press,” the crucial point was that the medium could enable random access, or dynamic pathways through vast amounts of multimedia content. Negroponte predicted that

New styles of authorship will emerge in the interstices of print and performance, oration and poetry, and still and motion pictures. In addition, the user—the reader—can become an active agent, implicitly or explicitly calling forth personalized editions of information.... The idea of a personalized movie turns what used to be a purely sequential process into a randomly accessible medium without specific beginning, middle, or end. In large measure, the viewer can be seen as editor in control of modes of representation, degrees of elaboration, or points of view.

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<sup>77</sup> Brand, *The Media Lab*, 10. MIT social scientist Ithiel de Sola Pool’s notion of “convergence,” to describe the “blurring of lines between media” in a digital age is also useful in this regard. See Ithiel De Sola Pool, *Technologies of Freedom* (Cambridge, MA: Harvard University Press, 1983).

<sup>78</sup> Negroponte, “Arts and Media Technology,” 20.

This ethos resembled Cooper's approach to media in at least two ways: on the one hand, it promised greater agency to creators, to exceed the normal boundaries between content- and form-making and production; on the other, it allowed readers the agency to move in a non-linear way through the material, and enlarge it in the ways they see fit. Of course, the latter kind of agency in some ways diminishes the former: the integrity of the author's vision is no longer inviolate as a single, narrational experience, but it is instead a matter of creating media which the user could inhabit and navigate freely. "Consider," Negroponte offered, "an encyclopedia of the future: you look up 'Patagonia' by going there."<sup>79</sup> This vision resembled Cooper's later reimagining of the Bauhaus book as a multimedia, digital object in which entries could lead to audio, video, architectural simulations, and user submitted and edited content.

The proposed arts and media technology facility would be, at its core, interdisciplinary.<sup>80</sup> Describing the (co-)location of different arts and technology activities within the building, Negroponte wrote, "All of these proximities and 'neighborhoods' correspond to intellectual overlaps and conceptual boundaries that don't occur normally in a university, especially in liberal arts colleges, where well-formed traditions in the arts have resulted in well-formed boundaries between the various art forms, and between the arts and science. In some sense, MIT can be said to be capitalizing on what have been, to date, disjoint and ad hoc efforts in visual studies, computer graphics, and electronic music." Breaking down the six "departments" of the Master of Science in Visual Studies program, "10 areas of study are proposed, with a particular

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<sup>79</sup> Ibid., 22.

<sup>80</sup> The Lab later described itself as "antidisciplinary," for exploring wholly new problems. See Joi Ito, "Antidisciplinary," *Joi Ito's Web* (blog), October 2, 2014, <https://joi.ito.com/weblog/2014/10/02/antidisciplinar.html>.

eye toward dismantling the Architecture Machine Group, by far the largest, into smaller programmatic chunks.” These areas were:

1. computer graphics and animation;
2. interactive and digital video processing;
3. experimental hard and soft copy;
4. man-machine relations and human factors;
5. color theory and applications;
6. photo-electronics and dry photographic processing;
7. digital and spatial audio processing;
8. consumer electronics and personal computing;
9. holography and holographic movies;
10. projection technology and experimental filmmaking.

While these areas bore affinities to existing departments, such as electrical engineering or computer science, what distinguished them here would “lie in the concerns for the qualitative aspects [of media], often subjective and hard to measure, but of increasing importance.” Some of the applications considered, for example, included: “teleconferencing, mapping, and management information systems, the latter specifically focused at making the top manager more creative and effective.” In this connection, one sees how Cooper’s expertise would be valued. Discussing consumer electronics, or “computers in the home,” Negroponte raised the issue of what would soon be termed “user friendliness.” “In looking at enhancing the richness of the particular interface, just a few years ago it would have been laughably unscholarly, if not shameless, to worry about the ‘pleasurability’ of using it: does the keyboard feel good, is the display satisfying, are the input devices comfortable? The answers are so temporal and subjective that the questions are drawn out of the main line of scientific inquiry.” Yet consideration of aesthetics and ergonomics, how fonts look and tablet devices feel, placed designers like Cooper in a privileged position within this new complex.

The VLW’s own specialty was offered here as exemplary of this productive new area of interdisciplinary work. Negroponte referred to

the new world of soft copy, whether on conventional cathode ray tubes or their future, solid state, flat, flexible, and waterproof counterparts. In comparison to hard copy, with which we associate graphic design, little attention has been paid to the graphical qualities of TV displays. Recent font work at MIT (a unique collaboration between typography and computer graphics) is illustrated in this article. It is just the beginning of what a laboratory for Media Arts and Sciences may have to offer through unique intersections of different backgrounds, purposes, and methods of work.

The MSVS was cited as “the forerunner of intellectual liaison and debate among the cast of characters who will occupy the major portion of the new facility.”<sup>81</sup> “To date, the program has been very much a ‘*Salon des Refusés*.’ It has embraced undergraduates from fine arts programs who have technological thirsts unquenchable by design schools and undergraduates from engineering programs who have frustrated interests in the subjective and intangible issues rooted in the qualities of human usage.” Negroponte would also use this turn of phrase elsewhere to describe the faculty who founded the group, citing Minsky, Papert, Cooper, and Leacock:

What these people had in common were varying degrees of rejection from their home disciplines. Each was considered a bit too extreme and had been rebuffed. While some people may not see it exactly this way, you get my point... Jerry [Wiesner] delighted in the composition of the original group, because he clearly saw that the fringe was becoming central. when we started this project, nobody was interested in the human computer interface. By the time we finished the building, the look and feel of computers was advertised in full-page spreads in the *Wall Street Journal*. The periphery rapidly became the center. This *Salon des Refusés* was at the right place, at the right time.<sup>82</sup>

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<sup>81</sup> Ibid., 26.

<sup>82</sup> Nicholas Negroponte, “The Origins of the Media Lab,” in *Jerry Wiesner: Scientist, Statesman, Humanist: Memories and Memoirs*, ed. Walter A Rosenblith (Cambridge, MA: MIT Press, 2003), 154.

## Chapter 4. Media Lab Computer as Tool, Assistant, Medium

### An Architecture for Media

The Wiesner building, designed by I.M. Pei & Associates, was well-sited as a hinge between the old campus and the then-emerging East Campus. While the design would change somewhat between the version published in 1980 and the one that was completed in 1985, mainly by becoming smaller, the essential features would remain the same: it was a big, six-story box with a central, skylit atrium; its key position on campus was marked by a striking, reinforced concrete gateway, somewhat like a late Corbusian take on a Japanese *torii* (fig. 4.1). The building, at its opening, would house the Media Lab, the Albert and Vera List Visual Arts Center (MIT's contemporary art gallery), and the Council for the Arts at MIT.<sup>1</sup>

Pei, a graduate of MIT who had designed three previous buildings on campus,<sup>2</sup> did not consider this one “a major architectural statement,” but it was nevertheless distinct from his earlier work, in form and design process, and from other buildings on campus.<sup>3</sup> As built, the Lab is wrapped with a grid of white-painted, modular steel panels interspersed with tinted ribbon windows. The effect is of a hermetic, high-tech corporate center, rather opaque to the outside (and indeed, quite compartmentalized within). The *Boston Globe*'s architecture critic, Robert Campbell, saw “a slightly frigid austerity” as the building's defining trait: Rather than signaling its special status as an arts building on campus, he noted, “it looks very much like the kind of

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<sup>1</sup> The building today also houses, among other departments, the MIT Program in Art, Culture and Technology, formed in 2009 from the merging of the Center for Advanced Visual Studies and MIT's Visual Arts Program.

<sup>2</sup> Prior to this, Pei's firm executed the Landau Chemical Engineering Building, the Dreyfus Chemistry Building, and the Green Center for the Earth Sciences.

<sup>3</sup> Steve Huntley and Michiel Bos, “Pei Explains Architecture of Wiesner Building,” *The Tech*, October 4, 1985.



slick, anonymous corporate package you might find occupied by a computer firm in a suburban office park.”<sup>4</sup>

Reading the building’s skin elsewhere, Campbell noted that “The grid surface of the exterior is, whether intentionally or not, itself a metaphor for technology—immediately suggesting, by association, a positivist world of graph paper and number matrices.”<sup>5</sup> Yet the building’s design also telegraphs its status as a certain kind of media architecture. Reinhold Martin has analyzed the curtain wall in postwar American architecture as essential to “the new physiognomy of the office.”<sup>6</sup> Martin describes, here in the context of a 1958 facility designed by Eero Saarinen for IBM, the “project of dematerialization associated with the reflectivity and transparency of many curtain walls and—through a common commitment to image-based communication—with postindustrial capital and media technologies.”<sup>7</sup> While not employing a curtain wall, the Media Lab fits this description in form and function. Indeed, this postwar

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<sup>4</sup> Robert Campbell, “A Space That’s Too High-Tech for Art,” *Boston Globe*, October 8, 1985. Campbell would later praise the new Media Lab Building (E14), designed by Fumihiko Maki & Associates, opened in 2009, and connected to the old one, for being its opposite: “You can think of it as an exercise in transparency. The Media Lab has long been famous for hiding itself in a building by I.M. Pei that was a nearly windowless box. The new building, which joins the Pei at one edge, is exactly the opposite. From outside, you can look all the way through it from one end to the other. It’s sheathed in shimmering glass and metal screens that allow about half the sunlight through to the interior. You feel that the building is temptingly veiled, not blanketed.” Robert Campbell, “Media Lab Aims to Elevate Transparency,” *The Boston Globe*, December 6, 2009, [http://archive.boston.com/ae/theater\\_arts/articles/2009/12/06/mit\\_media\\_lab\\_elevates\\_transparency/](http://archive.boston.com/ae/theater_arts/articles/2009/12/06/mit_media_lab_elevates_transparency/).

<sup>5</sup> Robert Campbell and Jeffrey Cruikshank, “Art in Architecture,” *Places* 3, no. 2 (Fall 1986), 5. This article is an excerpt republished from MIT Committee on the Visual Arts, *Designing the Wiesner Building: Artists and Architects Collaborate* (Cambridge, MA: MIT Committee on the Visual Arts, 1985).

<sup>6</sup> Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge, MA: MIT Press, 2003), 95. Martin has also connected the logic of the curtain wall to the industrial design of computers. See Reinhold Martin, “Computer Architectures: Saarinen’s Patterns, IBM’s Brains,” in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, ed. Sarah Williams Goldhagen and Réjean Legault (Montreal and Cambridge: Canadian Centre for Architecture and MIT Press, 2000), 141–164.

<sup>7</sup> *Ibid.*, 161–3.

genealogy brings us directly to the present: “the architecture of the curtain wall,” Martin writes, “haunts all debates in today’s digital age, which is to say today’s globalized age.”<sup>8</sup>

The logic of a corporate, mediatized architecture also extends to “the information age interior,” as John Harwood has shown, in an argument linked to Martin’s, and also in the context of IBM at midcentury.<sup>9</sup> Describing the minimal interiors specified by Eliot Noyes as a designer and consultant for IBM, “the first to confront the problem of designing a building for corporate activity that was ‘on line’ in ‘real time,’” Harwood writes: “Beyond its futuristic ‘clean room’ aesthetic appeal, it is clear that Noyes considered the ‘white room’ a space in and through which IBM could most efficiently communicate its capacity to control information—a noiseless space, almost hermetically sealed, devoid of unwanted environmental stimulus.”<sup>10</sup> Harwood’s description of a new typology of media architecture is apt to the Media Lab’s many air conditioned white rooms and enveloping, carpeted spaces to dampen noise, auditory or informatic, given its status as a nodal point for media relays.<sup>11</sup> Harwood concludes that “Architecture, conceived of in this way, becomes something like a cybernetic, ergonomically sound, and almost hermetically sealed Vitruvian hut: a counterenvironment designed to preserve the human, corporate, or national body from an ever changing, ever hostile outside.”<sup>12</sup>

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<sup>8</sup> Ibid., 13.

<sup>9</sup> See John Harwood, “The White Room: Eliot Noyes and the Logic of the Information Age Interior,” *Grey Room*, no. 12 (July 1, 2003), 7–31.

<sup>10</sup> Ibid., 21.

<sup>11</sup> At the core of the Wiesner building, on its lower level, is a double-height, elaborately equipped media space, still in use by the ACT program, known as “the cube” (room 001). The cube is “a black box theater” that is “used as a classroom, studio, production and performance lab space.” <http://act.mit.edu/facilities-and-resources/facilities/act-cube/> Accessed January, 8, 2017. In this sense, it is a black box that functions as a white room.

<sup>12</sup> Harwood, “White Room,” 26. Harwood borrows the term “counterenvironment” from Marshall McLuhan, while also using it in a slightly different way. See Marshall McLuhan, “The Invisible Environment: The Future of an Erosion,” *Perspecta* 11 (January 1, 1967): 163–67.

The possible coldness of Pei's design was leavened, for Campbell and other critics, by a unique attribute of the building: It was, from its planning stages forward, to be a collaboration between an architect and artists—specifically those whose work can be broadly if inadequately described as “environmental art,” or art intervening on the built environment in a public or semi-public setting.<sup>13</sup> The three artists who ultimately participated were Kenneth Noland, Richard Fleischner, and Scott Burton. Without going into detail on each of the projects, Noland's is the most significant as an architectural intervention, with its painted lines of color coursing between the panels on the outside of the building and gathering, most dramatically, in the atrium (fig. 4.2). “The frequent color changes,” write Campbell and Cruikshank, “suggest moving electronic impulses against a subtly flickering background of tinted panels.”<sup>14</sup> Noland's intervention provided inspiration for the variable identity system of the Media Lab, designed by Betsy Hacker of MIT Design Services. An indication of how far Cooper's group had moved, in terms of both institutional culture and technical means, the businesslike, binary appearance of the new Lab identity contrasted markedly with the exuberant brushiness of Ralph Coburn's identity for the original VLW.

Noland's work enlivened the Pei building considerably. But for a critic like Campbell, it remained, as his review's headline put it, “A space that's too high-tech for art.”<sup>15</sup> This review was of the building, as architecture, rather than the academic programs housed within, but it nevertheless touched on a question of cultural orientation for the new institution. After all, the

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<sup>13</sup> Kathy Halbreich, then director of exhibitions for the MIT Committee on the Visual Arts, issued invitations based on this criterion; the process is described in detail in Robert Campbell and Jeffrey Cruikshank.

<sup>14</sup> Campbell and Cruikshank, 9.

<sup>15</sup> Robert Campbell, “A Space That's Too High-Tech for Art,” *Boston Globe*, October 8, 1985.

marriage of technology and art was fraught for many. A few years prior to the building's opening, the Center for Advanced Visual Studies canceled its plans to co-locate with the Lab in the new building. As Piene explained to a *Boston Globe* reporter introducing the Lab to the city in a feature article:

The idea over there is that art will serve technology. We're not interested in that. We're interested in free expression, free association, and the choice of purpose and ideals. Technical perfection is uninteresting to us. I think it's dangerous for artists to get too proud of how things click.<sup>16</sup>

Long alert to questions of funding sources, and resistant to engaging the military-industrial complex, Piene continued:

Industry, which has replaced government as the primary target of fund-raising efforts, is often interested in the advancement of technology, or results that will at least feed back into industry. But there's a dilemma: If you serve specific sponsors for specific purposes, your art may end up serving the interests of the sponsors more than art itself. That's a problem.

The vicissitudes of Piene's relationship to the emerging arts and technology program are too elaborate to detail here, and have been well chronicled elsewhere, but they illustrate an important set of concerns surrounding the project, and the status of art within it.<sup>17</sup>

The *Globe* article introduced the Lab to the city in 1985 with the headline, "Greetings from the 1990s." The top-line summary recasts the audacious analogy of the Media Lab as a Bauhaus for the information age—an aspiration repeated by Cooper in her comments quoted in the article—with a more current, more local, and perhaps more accurate analogy: "What the Harvard Business School is to corporate America is what they want their Media Lab to be to modern

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<sup>16</sup> Otto Piene, quoted in D. C. Denison, "Greetings from the 1990s: Predicting the Future by Inventing It," *Boston Globe*, magazine section, June 23, 1985, 9.

<sup>17</sup> See Matthew Wisnioski's two chapters in Arindam Dutta, ed., *A Second Modernism: MIT, Architecture, and the "Techno-Social" Moment* (Cambridge: MIT Press, 2013).

information technology.”<sup>18</sup> The logic of the Lab, it is explained, is to unite technologists and artists, so that the makers can help invent or advance the medium. Ron MacNeil is quoted as saying, as a reflection of his own engineering studies and art practice:

The people in this lab really have the chance to forge ahead as technologists. My career, for example, has been an attempt to come to grips with the ‘how’ at the same time as the ‘what.’ Unfortunately, artists—with a capital ‘A’—typically don’t try to push the technology ahead. Most of the time, they use it and go to something else.

Yet the author also interviews media artists who are ambivalent about the art-and-technology relationship. Vin Grabill, then a media artist who had earned his MSVS degree at MIT in 1981, warns: “You can really drown yourself in technology, especially around here. If you’re not a strong enough artist, you’ll just float from one development to another. Fooling around with computer graphics is not an end, it’s a means to an end.” In the context of Cooper’s VLW, however, if not in art-practice as such, this observation needs qualification. The VLW’s “fooling around with computer graphics” was systematic and productive, and the means—for both designers and users—were, in an important sense, the end.

### **Redesigning Design Education**

The Visible Language Workshop’s presence in the Wiesner Building was a departure from the inky chaos of its first home: in its sleek new facility, the VLW manifested as rows upon rows of computer workstations in a cool, air conditioned space. The VLW’s place within MIT also represented a reorientation of the design profession at a crucial moment of technological change. As Sharon Poggenpohl, design educator and former editor of the journal *Visible Language*,

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<sup>18</sup> Ibid.

observed in 1983, the gap between design practice and advances in computer technology was expanding at a disconcerting pace. Though she is not writing about MIT, her diagnosis of this broad cultural problem, and her suggested solutions, suggest what it is that made the VLW different. Poggenpohl first cites prevailing attitudes within computer science that make new technologies seem inaccessible to designers:

A considerable amount of mysticism surrounds the computer and its use. Certainly its special language is no small barrier; easy entry into computer literacy is impossible. Within computer science departments at the university, the attitude is generally, "Learn my language and then we'll talk."<sup>19</sup>

Poggenpohl also notes the new ambiguity of the graphic designer's role, writing that "most definitions [of the profession] share a concern with visual attractiveness and print; they take a narrow, parochial view of the scope of graphic design." These problems combine with a lack of funding to support new design research, and few designers trained in technology and therefore able to teach it. In response, Poggenpohl proposes that:

Design can accept the challenge and close the gap between design practice and the new technology. But to do so, the designer must reorient; move from specialist to generalist; design a process rather than a special, isolated object. We have a head start because we understand visual systems and the issues surrounding visual language.

To this prescription, she added: "We need to become computer literate. We can select our literacy level, from user of existing programs to creative designer of new visual programs."

The VLW, as it appeared officially, two years later, within the MIT Media Lab, would solve many of these problems: it aimed to educate a new kind of designer, conversant in computers and competent with diverse, time-based media. And while Cooper herself lacked deep technical facility with computers, her students and collaborators possessed it in abundance.

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<sup>19</sup> Sharon Poggenpohl, "Creativity and Technology," *STA Design Journal*, 1983, 14–15.

Crucially, MIT's institutional context provided both stimulating interlocutors in related fields as well as ample research funds.

### **Sponsored Research**

Cooper's research at MIT would have been impossible without generous funding from both defense and corporate sponsors. Funding for research in American technical universities took an important step when MIT's own J.C.R. Licklider moved in 1962 from the Cambridge, Massachusetts-based technology company Bolt, Beranek, Newman to head the Advanced Research Projects Agency (ARPA), the precursor to today's Defense Advanced Research Projects Agency (DARPA). In so doing, he redirected much of ARPA's funding from companies to universities. The sponsored research of this period is an essential component of what Arindam Dutta has termed, in the context of MIT, the "techno-social moment," a period stretching roughly from the 1950s through 1980, characterized by both "big science" and "big social science."<sup>20</sup> Many in MIT's school of architecture, Dutta writes, pursued research informed by "linguistic, behavioral, psychological, computational and cybernetic paradigms," with a "wariness toward formalism and an aspiration toward expertise." Seeing themselves as agents of the state, these design researchers received funding from institutions including the World Bank, the Ford and Rockefeller Foundations, the Department of Housing and Urban Development, and the National Science Foundation. "To appeal to federal and corporate funding agendas," Dutta explains, "multiple 'micro-institutions' were established within MIT, from CAVS to HTC [History, Theory and Criticism of Architecture and Art] and the Media Lab." While it seems an

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<sup>20</sup> Arindam Dutta, "Linguistics, Not Grammatology: Architecture's A Prioris and Architecture's Priorities," in *A Second Modernism: MIT, Architecture, and the "Techno-Social" Moment* (Cambridge, MA: MIT Press, 2013).

exaggeration to suggest that these different institutions, with their diverse mandates and personalities, were created primarily as more efficient vehicles for funding, Dutta's conclusion, that "This worked against synthesis," is nevertheless salient. Indeed, it is the work of historians to tease out the commonalities and differences among many of these initiatives carried out simultaneously and in close quarters, if not always in direct collaboration.

The Architecture Machine Group exemplified the way design research could benefit from external funding. Molly Steenson writes: "Similar to other labs and groups at MIT and other major technical institutions, the majority of Arch Mac's funding came from defense research contracts with the Advanced Research Projects Agency... and the Office of Naval Research (ONR), among others, as well as from non-defense sources such as the National Science Foundation (NSF) and private corporations."<sup>21</sup> This funding naturally affected the nature of research to some degree: After an unsuccessful application to the NSF in 1977, Arch Mac turned increasingly to defense funding, with a corresponding focus on command and control technologies that would prove tactically useful in a military setting.<sup>22</sup>

Cooper collaborated on several of these military sponsored projects, given their focus on graphic user interfaces. While her work in helping to make these systems more intuitive, responsive, and "user-friendly" contributed to what Stewart Brand would later call the Media Lab's larger goal of "humanism through machines," the humanism of military applications, often

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<sup>21</sup> Molly Wright Steenson, "Architectures of Information: Christopher Alexander, Cedric Price, and Nicholas Negroponte and MIT's Architecture Machine Group," Ph.D dissertation (Princeton University, 2014), 163. Also see Molly Wright Steenson, *Architectural Intelligence: How Designers and Architects Created the Digital Landscape* (Cambridge, MA: MIT Press, 2017).

<sup>22</sup> Steenson, "Architectures of Information," 224.



designed to project force in more efficient ways, was not self-evident.<sup>23</sup> And while Cooper's well-known irreverence toward visiting generals, and powerful men in general, was common knowledge, it did not necessarily mitigate from the fact of indirectly supporting military applications. Janet Murray has described the blind spots of the so-called "engineering mentality," which might also be said to apply to designers in this context, alluding in passing to an Architecture Machine Group project to make her point:

The engineers are grounded in a tradition that emphasizes solution and defines the needs it cannot satisfy—and the suffering its solutions can inflict—as outside the domain of the problem. At its worst, the engineering mentality creates efficient killing machines, faster and more deadly arrows. It exults in the ability to "Put-That-There," to move weapons around a map with the flick of a magically gloved finger.<sup>24</sup>

In her few publications or public statements, Cooper does not dwell on these issues. Later in life, she would acknowledge some of the ethical questions associated with artificial intelligence, and the development of potentially autonomous machines, as a function of their funding. In 1989, she wrote: "The thrust of this long-term research [into artificial intelligence] has intellectual underpinnings that are supported by government and industry, and one must be alert to the intentions that drive such support. There is an inevitable Jekyll-Hyde syndrome that must be recognized and managed by us all."<sup>25</sup> She does not mention that "government" here means "military," or address what "managing" these intentions would entail; after all, the research culture at this moment prized fidelity to users' intentions, but the nature of those intentions, and

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<sup>23</sup> Brand, *The Media Lab*, 251. As a matter of policy, groups at the Institute were prohibited from doing classified research or work on weapons projects, yet command-and-control technologies were among the research areas that were acceptable. See D. C. Denison, "Greetings from the 1990s," n.p.

<sup>24</sup> Janet Murray, "Introduction: Inventing the Medium," in *The New Media Reader*, eds. Noah Wardrip-Fruin and Nick Montfort (Cambridge, MA: MIT Press, 2003), 4.

<sup>25</sup> Cooper, "Computers and Design," 30.

concrete applications, were either abstracted in demonstrations or considered outside the scope of the project. By contrast, there is a history of technological innovators at MIT evincing self-awareness about the risks of their creations, such as Joseph Weizenbaum's misgivings about the early "chatterbot" program he created,<sup>26</sup> or Norbert Wiener's broad warnings about the risk to human values presented by artificially intelligent machines.<sup>27</sup>

With the founding of the Media Lab, however, into which Arch Mac integrated, a much larger share of funding would come from commercial sources. This was the result of a seven-year fundraising effort by Negroponte and MIT President Emeritus Jerome Wiesner which netted more than \$40 million from American and Japanese companies in a range of industries.<sup>28</sup> The Lab offered sponsoring companies an unusual hybrid, something between a corporate research lab and an academic department, with a subscription model that ensured close contact to MIT students and faculty along with lower financial risk for investing sponsors. For Cooper's Visible Language Workshop, this funding came from companies such as nearby Polaroid, IBM, and the German print technology firm Hell GmbH, in the amount of \$250,000 at the time of its founding.<sup>29</sup> While this was one of the smallest units within the Lab, it counted as considerable financial support for a graphics research group. Through the 1980s and early 1990s, the VLW would enter multi-year research contracts to explore computer graphics and print technology projects with large companies such as Apple, Canon, Xerox, and others.

Even before joining the Media Lab, however, and on a much smaller scale, Cooper and

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<sup>26</sup> See Joseph Weizenbaum, *Computer Power and Human Reason: From Judgment to Calculation* (San Francisco: W.H. Freeman, 1976).

<sup>27</sup> See Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (New York: Avon Books, 1980).

<sup>28</sup> Steenson, "Architectures of Information," 262.

<sup>29</sup> Brand, *The Media Lab*, 12.

MacNeil's Visible Language Workshop had been adept at garnering donations or loans from local print technology and photography companies, whether as a favor, or to some degree as an out-of-house research-and-development unit. MacNeil, for example, secured funds in a long-term collaboration with the Outdoor Advertising Association, a local billboard printing company, to develop his large-scale "Airbrush Plotter" as a form of digital output (fig. 4.3). For many years, this huge contraption, constantly iterated upon, would be the first thing visitors to the VLW would notice. MacNeil could manipulate files before "printing" to the plotter by using a proto-Photoshop software tool developed at the VLW called "SYS." Sponsorships like these allowed the VLW to experiment with new technology that would have otherwise been inaccessible.

### **Access to Tools**

The VLW, from its founding through its later years, displayed a consistent interest in designing the tools of design themselves. As Cooper put it, in a programmatic summation of the group's work: "We aim to make the tools and to use them."<sup>30</sup> Even as early as her time exploring experimental technologies at the MIT Press, Cooper emblemized the figure of the "designer as producer,"<sup>31</sup> a phrase coined by Ellen Lupton with reference to Walter Benjamin's 1935 essay "The Author as Producer."<sup>32</sup> As an alternative to the notion of "designer as author,"<sup>33</sup> Lupton

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<sup>30</sup> Muriel Cooper or VLW staff, Description of the VLW, Cooper Papers.

<sup>31</sup> Ellen Lupton, "The Designer as Producer" [1998], in *Graphic Design: Now in Production*, eds. Andrew Blauvelt and Ellen Lupton (Minneapolis: Walker Art Center, 2011). Originally published in *The Education of a Graphic Designer*, ed. Steven Heller (New York: Allworth Press, 1998).

<sup>32</sup> Walter Benjamin, "The Author as Producer" [1935], *New Left Review* 1, no. 62 (August 1970).

<sup>33</sup> See Michael Rock, ed., "Designer as Author" [1996], in *Multiple Signatures: On Designers, Authors, Readers and Users* (Rizzoli, 2013).

borrowed from Benjamin the idea that artists must revolutionize the means of production and distribution for their work. She elaborates:

The proletarianization of design offers designers a new crack at materialism, a chance to reengage the physical aspect of our work. Whereas the term ‘author,’ like ‘designer,’ suggests the cerebral workings of the mind, production privileges the activity of the body. Production is rooted in the material world. It values things over ideas, making over imagining, practice over theory.<sup>34</sup>

The materiality of design was mainly a phenomenon of Cooper’s mid-1970s work in the Visible Language Workshop, while her later career would involve more immaterial technologies.

Lupton’s larger point, however, is that the designer must be in control of his or her tools, be they digital or analog, and indeed empower users in a similar way:

The challenge for designers today is to become the masters, not the slaves, of technology. There exist opportunities to seize control—intellectually and economically—of the means of production, and to share that control with the reading public, empowering them to become producers as well as consumers of meaning.<sup>35</sup>

The Walker Art Center and Cooper-Hewitt National Design Museum’s catalog for the 2011 exhibition *Graphic Design: Now in Production*, which highlighted work made after 2000 that depended on the wide availability of digital tools, included Lupton’s essay. (The exhibition was an update of the Walker’s 1989 exhibition *Graphic Design in America: A Visual Language History*, in which Cooper was featured, with an interview by Steven Heller.<sup>36</sup>) The catalog featured a portrait of Cooper on its inside cover, as a kind spiritual forerunner for the present state of the field; that is, her work was not included in the show, by virtue of its time frame, but her spirit, for the curators, pervaded it. Likewise, the show included work by both trained

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<sup>34</sup> Lupton, “The Designer as Producer” [1998], 13.

<sup>35</sup> Ibid.

<sup>36</sup> Heller, “Muriel Cooper.”

professionals and the enthusiastic creators empowered by the so-called Web 2.0 moment.<sup>37</sup> This state, in which robust creative tools are easily accessible to a wide range of users, who might use them in a non-professional, recreational, capacity—and circulate them widely as well—is one gestured toward by Negroponte in his 1979 essay “The Return of the Sunday Painter.”<sup>38</sup>

From her time using analog tools as a designer, and teaching with them as an educator, Cooper understood the frustrations associated with mass production, and taught students to hack their existing tools as a way of achieving greater control. Now, in the context of computation at MIT, Cooper had greater control over the development of the tools themselves. In 1981, she mused that the computer might offer a return to the agency of a time before Gutenberg. She spoke of the

idea of instant visualization, of effecting the production tool, or the reproduction tool, being able to respond back to the tool very fast, “Oh it’s too red,” “oh it’s too green,” all that sort of comes from the frustrations of having dealt professionally... the new tools are going to, if they are in some way controlled or understood by the users, become as interactive as these cruder things that we have described... the idea of typesetters on your desk gives you a kind of control you haven’t had since you were a medieval monk.<sup>39</sup>

In this Cooper followed a pattern set by other technological innovators, namely to imagine and create tools to facilitate one’s own disciplinary pursuits, be they scholarly, architectural, or, in Cooper’s case, typographic. This thread runs through the history of computing. Vannevar Bush, for example, as a scientist and science administrator, imagined his “memex” as an aid to processing scientific research,<sup>40</sup> not unlike Tim Berners Lee developing the World Wide Web in

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<sup>37</sup> See Darcy DiNucci, “Fragmented Future.” *Print*. 53 (4), 1999: 32.

<sup>38</sup> Nicholas Negroponte, “The Return of the Sunday Painter,” in *The Computer Age: A Twenty-Year View*, ed. Michael L. Dertouzos and Joel Moses (Cambridge, MA: MIT Press, 1979), 21–27.

<sup>39</sup> Muriel Cooper, “Graphics and New Technology,” slide talk at the Visible Language Workshop, 1981.

<sup>40</sup> Bush, the engineer and administrator who led the Office of Scientific Research and Development (OSRD) during the Second World War, later taught at MIT, and made the initial steps toward founding what would become the National Science Foundation (NSF). In his seminal *Atlantic Monthly* article of 1945, “As We May Think,” he turned

1989, initially to facilitate information sharing within his organization’s large internal network.<sup>41</sup> (It is worth noting that in both cases, these “inventions” combined existing technologies—microfilm and cameras in the first, and hypertext linkages and the network of devices that was the internet in the second.) Likewise, Ted Nelson’s idea of hyperlinking emerged to “do the dirty work of personal file and text handling” in the scholar’s writing process, and indeed to reflect the interwoven, non-hierarchical, and fluid nature of thought.<sup>42</sup> The Architecture Machine Group at MIT also began as a group of architects intent on reforming the tools of architectural design and representation. Their research yielded insights far beyond the field, but it began with the concerns of their own discipline. Computer scientist Alan Kay summarized well the enduring interest in inventing better tools, writing in 1989:

The notion of a tool has always been a romantic idea to humankind—from swords to musical instruments to personal computers, it has been easy to say: “The best way to predict the future is to invent it!” The romantic dream of “How nice it would be if...” often has the power to bring the vision to life.<sup>43</sup>

Kay and his colleagues championed engagement with the process of computing itself— not just

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his attention to an early computational device. After the common cause forged among researchers during the war, Bush asked, “What are the scientists to do next?” His proposed answer was a device to improve communication among his colleagues as a way of combatting over-specialization and the unwieldy quantities of research in circulation. His thought-experiment was the “memex,” a microfilm-based personal device that would allow for rapid storage, retrieval, data entry, and linkage between records. While the cumbersome desk-as-hardware Bush imagined would remain hypothetical, his requirements for ease of use and his focus on personalization and the user interface anticipated the discussions of computer pioneers some two decades later. See Vannevar Bush, “As We May Think,” *The Atlantic*, July 1945, <http://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881>.

<sup>41</sup> See “Sir Tim Berners-Lee,” A.M. Turing Award, ACM (Association for Computing Machinery), 2016, [https://amturing.acm.org/award\\_winners/berners-lee\\_8087960.cfm](https://amturing.acm.org/award_winners/berners-lee_8087960.cfm). Berners-Lee’s organization was CERN, the European Organization for Nuclear Research.

<sup>42</sup> See Ted Nelson, “A File Structure for the Complex, the Changing, and the Indeterminate,” ed. Lewis Winner, *Association for Computing Machinery: Proceedings of the 20th National Conference, 84–100*, 1965. Nelson’s reference to “the complex, the changing, and the indeterminate” also happens to be an excellent description of Cooper’s own dynamic, interlinked, and anti-hierarchical approach to both print and new media.

<sup>43</sup> Alan Kay, “User Interface: A Personal View” [1989], in *Multimedia: From Wagner to Virtual Reality*, ed. Randall Packer and Ken Jordan (New York: W.W. Norton, 2001), 131.

that computers could empower the user, but that the user must be empowered to hack and tinker with the computer. Similarly, the covers of Ted Nelson's seminal, self-published, 1974 booklet *Computer Lib*, bound back-to-back with its twin, *Dream Machines*, features on its cover a raised fist against the background of a punchcard, and the subtitle "You can and must understand computers now."<sup>44</sup> (fig. 4.4) "Computers," Nelson declared, "are simply a necessary and enjoyable part of life, like food and books. Computers are not everything, they are just an *aspect* of everything, and not to know this is computer illiteracy, a silly and dangerous ignorance."<sup>45</sup> This statement of technical illiteracy can be read as an update Moholy-Nagy's dictum that the illiterate of the future will be incapable of using the camera; both imply an iconic visual language, and that the technical device should be mastered not just as it was intended to be used, but also that it should be used creatively to new ends. The mantra of individual empowerment through computing technology was also visible in architecture, in Negroponte's *Architecture Machine* as well as Edward Allen's anthology *The Responsive House*, which featured the phrase "Do Your Own Thing" on its cover (fig. 4.5).<sup>46</sup> This phrase recurs, in an art context, in Otto Piene's briefest entry in *More Sky*, just two sentences under the heading "Computer" that express both openness and empowerment: "Welcome Computers. Do your own thing."<sup>47</sup> The accompanying illustration is similarly spare: the thick outlines of an empty square, a vessel for the user's imagination (fig. 4.6). Indeed, artistic practice, with or without computers, seemed compatible with this approach; as Negroponte told Brand, on an early visit to the Media Lab:

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<sup>44</sup> See Ted Nelson, *Computer Lib/Dream Machines* (self-published, 1974).

<sup>45</sup> *Ibid.*, 2.

<sup>46</sup> Edward Allen, ed., *The Responsive House* (Cambridge, MA: MIT Press, 1974).

<sup>47</sup> Otto Piene, *More Sky* (Cambridge, MA: MIT Press, 1973), 44.

“The attitude toward artists throughout the Lab is respectful but not worshipful— they’re regarded as hackers minus computers, one of us.”<sup>48</sup> And it was Brand who wrote in his *Whole Earth Catalog* almost two decades earlier, as a paean to new technology: “We are as gods and might as well get used to it.”<sup>49</sup>

Cooper was known to have been frustrated by her experiences trying to learn to code. She enrolled in Nicholas Negroponte’s 1967 summer course in computer graphics, only to declare that programming “didn’t make any goddamned sense to me.”<sup>50</sup> (A portrait of Cooper and her friend Donis Dondis (fig. 4.7), converted from a photograph to the text-based character set of ASCII code (short for American Standard Code for Information Exchange), is the only surviving artefact of this course; its exact authorship is uncertain). Lisa Strausfeld, a master’s student at the Media Lab from 1993–94, later observed: “I’m fascinated by Muriel’s confidence in what she did not know.... She was not at all skilled technically, and she wasn’t even that tech-savvy, and she leveraged her ignorance in a truly brilliant way.”<sup>51</sup> Strausfeld recalls that Cooper consistently separated discussions of design and those of technology, sometimes even forbidding the latter in her presence.<sup>52</sup> Technology, for Cooper, was to be instrumental to higher-order aims, to the logic and quality of the interaction. Throughout her career, Cooper had the luxury of avoiding such discussions, surrounded as she was by extremely capable collaborators and students, whether

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<sup>48</sup> Brand, *The Media Lab*, 83.

<sup>49</sup> Stewart Brand, ed., *Whole Earth Catalog* (Menlo Park, CA: Portola Institute, 1969).

<sup>50</sup> Alice Rawsthorn, “Muriel Cooper: The Unsung Heroine of On-Screen Style,” *The New York Times*, September 30, 2007, <http://www.nytimes.com/2007/09/28/style/28iht-design1.1.7670693.html>.

<sup>51</sup> *Ibid.*

<sup>52</sup> Lisa Strausfeld, remarks during exhibition opening discussion for “Messages and Means: Muriel Cooper at MIT,” Arthur Ross Architecture Gallery, Columbia University, February 25, 2014.



UROP assistants at the MIT Press office,<sup>53</sup> Ron MacNeil in the early days of the VLW, or students like David Small and others at the Media Lab. But the “leverage” she exerted was effective in the guidance Cooper provided students and collaborators, perhaps in harmony with Kay’s reference to “the romantic dream of ‘How nice it would be if...’” as a way of bringing ideas to life. These what-ifs, variously functional, conceptual, formal, or fanciful, were—in combination with highly capable people and powerful technologies—quite generative. In this sense, just as Cooper might have inhabited a “digital imaginary” starting in the late 1960s, with her dawning awareness of the potential of computers, the level of her engagement in many ways continued on this conceptual level.<sup>54</sup> An example of leveraging a lack of understanding was Cooper’s interaction with Henry Lieberman, an artificial intelligence researcher who worked with the Visible Language Workshop starting in the late 1980s. Lieberman recalls:

Muriel was a non-technical person, and made attempts from time to time to learn to program, but without success. However, she had extremely good intuitions about programming and had a programmer’s way of thinking about design problems (hence “Visible Language”). Because she was such a visual thinker, she was flabbergasted to the point of being offended that programming wasn’t as visual as it had the potential to be.<sup>55</sup>

In response, around 1991, Lieberman developed animated, three-dimensional representations of programming (fig. 4.8). These cubic volumes, reminiscent of abstract cereal boxes, could be variously combined, with corresponding changes in the code. As Lieberman explains, “It was my small attempt to render programming a little bit more visible for her.”<sup>56</sup>

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<sup>53</sup> UROP, the Undergraduate Research Opportunities Program, offered research positions to MIT undergraduates.

<sup>54</sup> For more on this conceptual level of engagement, see Wiesenberger, “Latter-Day Bauhaus? Muriel Cooper and the Digital Imaginary.”

<sup>55</sup> Henry Lieberman, email to the author, October 29, 2013.

<sup>56</sup> *Ibid.*

The essential transition that Cooper negotiated in her late years was from the computer as one tool among many in creating visual messages to the medium itself, within which all other media would circulate. The titles of Cooper's summer session courses over a short period reflect this shift: In 1979, the VLW presented "Graphic Design: Computers and Other Tools"; in 1983, however, it offered "The New Graphics: A Computer Workshop in Visual Communication," suggesting that the graphics field itself was now the domain of the computer. As Alan Kay and Adele Goldberg wrote in 1977, imagining the possibilities of their "Dynabook" as a personal computer: "What would happen in a world in which everyone had a Dynabook? If such a machine were designed in a way that *any* owner could mold and channel its power to his own needs, then a new kind of medium would have been created: a metamedium, whose content would be a wide range of already-existing and not-yet-invented media."<sup>57</sup> Expanding on this coinage of the metamedium, Kay reflected in 1989 on the lessons he had taken from Marshall McLuhan:

The sum total to me [of McLuhan] was a shock that reverberates even now. The computer is a medium! I had always thought of it as a tool, perhaps a vehicle— a much weaker conception. What McLuhan was saying is that if the personal computer is a truly new medium, then the very use of it would actually change the thought patterns of an entire civilization.<sup>58</sup>

Within this medium, in all its fluidity, diverse content could coexist and be accessed in the non-linear way Cooper had sought from all media: As she conceded in the 1990s, "I guess I'm never sure that print is truly linear."<sup>59</sup> Likewise, the use of videodisc technology at the Architecture Machine Group, and the appeal of hyperlinking—as Cooper reimagined a digital version of *The*

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<sup>57</sup> Alan Kay and Adele Goldberg, "Personal Dynamic Media," *Computer* 10, no. 3 (March 1977), 40.

<sup>58</sup> Kay, "User Interface: A Personal View" [1989], 124.

<sup>59</sup> Abrams, "Muriel Cooper: 1994 AIGA Medal."

*Bauhaus*—all underscore her interest in new media’s properties even as she worked in the world of print.

### **The Systems Turn**

From the late-1960s onward, much of Cooper’s work, and that of her MIT colleagues, can be understood in the context of a broader contemporary interest in systems, and the advent of what the artist, art critic, and curator Jack Burnham deemed at the time “systems aesthetics.”

Burnham, who was a fellow at MIT’s Center for Advanced Visual Studies from 1968–69, borrowed the idea of systems from theoretical biology and the discourse on cybernetics to describe contemporary conceptual and research-based artistic practices.<sup>60</sup> In his fellowship application for CAVS, Burnham sent Kepes the proposal for his 1968 book *Beyond Modern Sculpture*. In the final chapter of that book, “The Future of Responsive Systems in Art,” Burnham wrote that “systems-oriented art,” beyond sculpture as it had been understood, would “deal less with artifacts contrived for their formal value, and increasingly with men enmeshed with and within purposeful responsive systems.”<sup>61</sup> He predicted that this “shift from objects to systems” might mean that “that the future artist, as part of a tiny technological elite, may find himself in the position of some of today’s Nobel Prize scientists: rather than being humble experimenters in the laboratory, some are executives manipulating research money and the projects of men under them.”<sup>62</sup> This idea proved prescient given the sponsored research context in which Cooper and her colleagues would pursue their work.

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<sup>60</sup> Melissa Ragain, “Introduction,” in *Dissolve into Comprehension: Writings and Interviews, 1964–2004* (Cambridge, MA: MIT Press, 2015), xi–xvi.

<sup>61</sup> Jack Burnham, “The Future of Responsive Systems in Art” [1968], in *Dissolve into Comprehension*, 92.

<sup>62</sup> Burnham, 92.

Burnham expanded on the idea in his article “Systems Aesthetics,” originally published in *Artforum* in 1968. As he wrote, “We are now in transition from an *object-oriented* to a *systems-oriented* culture. Here change emanates, not from *things*, but from the *way things are done*.”<sup>63</sup> This shift implies a “post-formalist aesthetic,” but again describes Cooper’s own shift from a focus on designed objects to one on design systems.<sup>64</sup> Artists might look toward the “systems analysis” practiced by military planners in the Pentagon, Burnham suggested, again anticipating some of MIT’s sponsored research in design. He imagined, correctly, that the artist here may not work alone, but rather with broader teams: “The scope of a systems aesthetic presumes that problems cannot be solved by a single technical solution, but must be attacked on a multileveled, interdisciplinary basis.”<sup>65</sup>

In Burnham’s 1969 lecture at the Guggenheim Museum, titled “The Aesthetics of Intelligent Systems,” he noted that the vantage point for his thinking was “McLuhanite: It is the mode of communication... rather than the message itself... that has defined and leveled our response to art.”<sup>66</sup> To put this insight in the terms of Cooper’s teaching at MIT, it was more the means than the message, or perhaps the means *as* message. In this dialogue between intelligent systems, both human and machine, Burnham observed that finer-grained and higher fidelity technologies for input and output would be crucial. In his lecture he cited J.C.R. Licklider, from a talk Licklider had given two years prior at the Metropolitan Museum of Art, saying: “He [Licklider] sees the need for larger, brighter, and more interactive display tubes, and also for

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<sup>63</sup> Jack Burnham, “Systems Aesthetics” [1968], in *Dissolve into Comprehension*, 116.

<sup>64</sup> *Ibid.*, 118.

<sup>65</sup> *Ibid.*, 121.

<sup>66</sup> Jack Burnham, “The Aesthetics of Intelligent Systems” [1969], in *Dissolve into Comprehension*, 141.

terminal equipment sensitive to light patterns, vibrations, pressure, textures, and sounds—in other words, the full array of sensory input-output devices available in human communication.”<sup>67</sup> It was precisely this interest in more sensitive input and display technologies that occupied the Architecture Machine Group during these years, and on which Cooper would collaborate as questions of computer graphics and typography were concerned. That this work did not fall under the traditional purview of art, design, or engineering was another phenomenon Burnham could illuminate; as he noted in the catalog introduction for his seminal exhibition *Software: Information Technology: Its New Meaning for Art*, at the Jewish Museum in 1970, these categories were of limited use. The exhibition, “makes none of the usual qualitative distinctions between the artistic and technical subcultures. At a time when the aesthetic insight must become a part of technological decision-making, does such a division still make sense?”<sup>68</sup> It was this exhibition that included—also on its catalog cover—a contribution from the Architecture Machine Group, the earlier described *SEEK*, whose work in these years laid the groundwork for Cooper’s sponsored research at the Media Lab (fig. 4.9).

## **Ethical Robots**

The man-computer symbiosis called for by Licklider in 1960 was intended to “enable man and computer to cooperate in making decisions and controlling complex situations without inflexible dependence on predetermined programs.”<sup>69</sup> This, he stressed, was different than “mechanically extended man,” in the sense of a tool; rather, he proposed a complementary system to automate

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<sup>67</sup> Burnham, 149.

<sup>68</sup> Jack Burnham, “Notes on Art and Information Processing [Introduction to *Software—Information Technology: Its New Meaning for Art*] [1970], in *Dissolve into Comprehension*, 160.

<sup>69</sup> J.C.R. Licklider, “Man-Computer Symbiosis,” *Transactions on Human Factors in Electronics* HFE-1 (March 1960), 4.

and even anticipate the user's goals: "The equipment will interpolate, extrapolate, and transform.... In general it will carry out the routinizable, clerical operation that fill the intervals between decisions." The idea of conversing with the machine was important to Licklider, as it was to the Architecture machine group, and he cites as potential users the military general as well as the captain of industry, both of whom needed to make swift decisions. Indeed, the Architecture Machine Group had imagined these same users as well as—to further demonstrate the system's ease of use, and pedagogical promise—a child. Licklider also stressed the importance of the interface, another major focus at Arch Mac: "Nowhere, to my knowledge... is there anything approaching the flexibility and convenience of the pencil and doodle pad or the chalk and blackboard used by men in technical discussion."<sup>70</sup>

Negroponte's goal in the Architecture Machine Group was to create "ethical robots," in the phrase of Warren McCulloch, or machines intelligent enough to discern their users' intentions rather than reflecting the priorities of their creators. This represented a step beyond merely automating user inputs for greater speed, and instead called for the machine to improve upon these inputs with its own suggestions.

### **Epistemology and the Interface**

Cooper's late work was about much more than trying to "cure the chronic ugliness of computer graphics and visual design," as Stewart Brand put it in his elliptical account of the VLW's role at the Media Lab.<sup>71</sup> It was certainly this, but it was also about considering the tools of design, and

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<sup>70</sup> Ibid., 9.

<sup>71</sup> Brand, *The Media Lab*, 12.

the logic of the human-computer interface. In one definition, advanced by researchers at Olivetti in the 1980s, the interface is “what lies between,” and “whatever allows us to link two different elements, to reconcile them, to put them into communication.” The “interface is also the immaterial meeting place between two states of reality, previously extraneous, that merge to exchange information, to interact. It is therefore a term that pertains to computer science, but also (when man is involved) to psychology.”<sup>72</sup> John Harwood has compellingly described the interface—both in its range of manifestations, and in its deceptiveness— as follows:

The interface is the crucial but often overlooked element in what ergonomics identifies as the “man–machine system.” It is the hyphen between “man” and “machine” that articulates the system as a whole. Whether it is a screen, a keyboard, a sitting surface, a proscenium, or a curtain wall (and it is often all of these and more), an interface is a complex apparatus that appears as a simple surface. Although it seems to be unitary, it is always fragmentary and complex; although it seems to be two-dimensional, it is always at least three-dimensional and rendered in depth; although it seems to be solid and impermeable, it is always carefully perforated to allow strategically mediated interactions between man and machine.<sup>73</sup>

The culture of the Media Lab, and the composition of its founding faculty, played an important role in its approach to the user interface. Specifically, insights into early childhood development and pedagogy underlay much of the thinking about interfaces, whether for adults or children. These insights privileged both agency for the user as well as a ludic character for machine interactions that would, in turn, simultaneously be edifying. In particular, Seymour Papert, who directed the Lab’s Epistemology and Learning research group, developed out of his graduate studies with Swiss clinical psychologist Jean Piaget the idea of “constructionism,” an experiential model of learning in which students construct their own mental models while

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<sup>72</sup> Gianni Barbacetto, *Design Interface: How Man and Machine Communicate, Olivetti Design Research by King & Miranda* (Milan: Arcadia, 1987), 11.

<sup>73</sup> John Harwood, *The Interface: IBM and the Transformation of Corporate Design, 1945-1976* (Minneapolis: University of Minnesota Press, 2011), 9-10.

manipulating material firsthand, rather than having lessons transmitted to them by the teacher. In his book *Mindstorms: Children, Computers, and Powerful Ideas*, Papert described a new relationship to the computer in the context of the Logo educational programming language he co-developed in the late 1960s:

In most contemporary educational situations where children come into contact with computers the computer is used to put children through their paces, to provide exercises of an appropriate level of difficulty, to provide feedback, and to dispense information. The computer programming the child. In the LOGO environment, the relationship is reversed: The child, even at preschool ages, is in control: The child programs the computer. And in teaching the computer how to think, children embark on an exploration about how they themselves think. The experience can be heady: Thinking about thinking turns the child into an epistemologist, an experience not even shared by most adults.<sup>74</sup>

The implications for the computer interface, whether for children or adults, were broad. Alan Kay recalls, rehearsing Piaget's insight into the developmental sequence of a kinesthetic stage, a visual stage, and a symbolic stage: "The work of Papert convinced me that whatever user interface design might be, it was solidly intertwined with learning."<sup>75</sup> Papert and his Media Lab colleague Marvin Minsky also affected Negroponte's thinking about how computers might enhance the user/designer's agency. In *Soft Architecture Machines*, of 1975, Negroponte cites Papert's notion of constructionism to suggest an interface that is simultaneously efficacious, empowering, and educational for the non-expert adult user, in this case one interested in contributing to the design of his or her own home:

One can consider a designland [sic] where one learns about design by playing with it. The underlying assumption is that, while you may not be able to design an efficient hospital or workable airport, you can design your own home, better than any other person. You already choose furniture, paint walls, and select decors for your house. If the building technologies supported the notion, what knowledge would you lack in order to move up a scale to allocate space and decide boundaries between indoors and outdoors.<sup>76</sup>

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<sup>74</sup> Seymour Papert, *Mindstorms: Children, Computers, and Powerful Ideas* (New York: Basic Books, 1980), 19.

<sup>75</sup> Kay, "User Interface: A Personal View" [1989], 126.

<sup>76</sup> Nicholas Negroponte, *Soft Architecture Machines* (Cambridge, MA: MIT Press, 1975), 109.



The idea of children interacting with computers, whether as a model or an intended outcome, was one that pervaded the work of Kay and the Dynabook he co-developed in Xerox PARC's Learning Research Group; Papert and Minsky's work at the Media Lab; and Negroponte's assertion, in *The Architecture Machine*, that "every child should have a computer."<sup>77</sup> Indeed, this would be the ambition of the One Laptop per Child (OLPC) project he initiated more than three decades later.<sup>78</sup>

### **Books without Pages**

In 1978, Cooper collaborated with psychologist Richard Bolt and Negroponte to submit a proposal to the National Science Foundation, under the aegis of the Architecture Machine Group, titled "Books without Pages" (fig. 4.10). The proposal coined and contemplated the digitally enabled phenomenon of "soft copy," or the fluid text that circulates on screens—in contrast to the fixed fact of printed "hard copy." Even in a new medium, however, the codex book, Cooper's bailiwick, did provide an essential metaphor. As Negroponte later wrote, in a 1979 report funded jointly by the Office of Naval Research and the Defense Advanced Research Projects Agency, after the NSF had rejected the team's initial proposal

this paper is about not throwing away the message with the medium while offering new technological opportunities for communication. In many regards the old-fashioned book

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<sup>77</sup> Negroponte, *The Architecture Machine: Toward a More Human Environment*, 6.

<sup>78</sup> The OLPC website states that its mission "is to empower the world's poorest children through education." It continues: "We aim to provide each child with a rugged, low-cost, low-power, connected laptop. To this end, we have designed hardware, content and software for collaborative, joyful, and self-empowered learning." This last modifier, of self-empowerment, suggests the consistent line of thought from Piaget and Papert forward. <http://one.laptop.org/about/mission> Accessed November 26, 2017.

remains the best random access information resource we have, but new opportunities include: personalization, sound synchronization, spatial data access.<sup>79</sup>

This phrase, meanwhile, that the book is the “best random access tool” available, applied a term from computer science—referring to the addressability of stored data, such that any piece be as easily retrievable as another—to the old-world technology of the book. It was uttered often by both Cooper and Negroponte.

An element of the traditional book’s user experience worth salvaging, according to the authors, was the existence of the page as a discrete “syntactic chunk,” as opposed to the endlessly scrolling text of the computer terminal. This was just one of the authors’ perceptual insights based on the spatialization of information as a mnemonic device for comprehension. The team discussed on-screen layout, then foreign to computer terminals, that would define the page as a unit. They also employed a crude, page-flipping animation to clearly signal the move between pages as a way of helping users orient themselves.<sup>80</sup>

The context for which “Books without Pages” was imagined was an environment known as the “Spatial Data Management System” (SDMS) (fig. 4.11). SDMS emerged from the 1977 master’s thesis of William Donelson in the Department of Architecture, advised by Negroponte. In the form of a brief text, and a 10-minute demonstration video, Donelson introduced an interface that one could inhabit. “This thesis addresses the notion of spatiality in data bases,” he explained.<sup>81</sup> The system depended on multi-modal inputs and feedback; that is, the redundant use

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<sup>79</sup> Nicholas Negroponte, “Books without Pages” [1979], reprinted in *\*The Journal of Computer Documentation* 20, no. 3 (August 1996): 2.

<sup>80</sup> This page-flipping behavior was developed by MIT undergraduate Christopher Schmandt, who would later join the faculty of the Media Lab. See Christopher Schmandt, “Pages without Paper,” unpublished undergraduate thesis, Department of Computer Science, MIT, Cambridge, MA, January 1979.

<sup>81</sup> William Campbell Donelson, “Spatial Management of Data” (Massachusetts Institute of Technology, 1977), 3.

of “three spatially informative senses— vision, hearing, and touch.”<sup>82</sup> The user sat in a customized Eames lounge chair with touchpads in the arms, a touchscreen, and a large, rear-projection screen. Invoking the perceptual mode that recurs through much of the work discussed here, the setup was intended to “allow the user to drive through the database much as a pilot flies an airplane.”<sup>83</sup> The SDMS relied on the simulated construction of space within the display, but also on the very real architectural space of the “media room.” As the SDMS project proposal put it:

The success of the SDMS paradigm rests in part upon the generation of a convincing, direct sense of space, possibly a multiplicity of spaces, behind and within the computer, so to speak. It is not sufficient that the User imagine such spaces to exist all the while functioning vis-a-vis data in an essentially *symbolic* fashion. This space, to be useful at its own level, had ought to be entered *qua* space.<sup>84</sup>

In addition to the instrumentation at the user’s fingertips, the “media room’s” interface depended on verbal commands. Made possible by the research of MIT students Chris Schmandt and Eric Hulteen, and supported by the Cybernetics Technology Division of the DARPA, this work was published by Richard Bolt as “Put-That-There: Voice and Gesture at the Graphics Interface.” Bolt’s paper explains that the Architecture Machine Group had “been experimenting with conjoin use of voice-input and gesture-recognition to command events on a large format raster-scan graphics display.”<sup>85</sup> There was great utility in the use of multiple modes of input: “Of

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<sup>82</sup> Ibid., 4–5.

<sup>83</sup> Ibid., 3.

<sup>84</sup> Spatial Data-Management proposal, 1, Cooper Papers, 12-284. “User” is capitalized in the original.

<sup>85</sup> Richard A. Bolt, “‘Put-That-There’: Voice and Gesture at the Graphics Interface,” *ACM SIGGRAPH Computer Graphics* 14 (1980): 262–70.

central interest is how voice and gesture can be made to inter-orchestrate, actions in one modality amplifying, modifying, disambiguating actions in the other.” Bolt elaborated:

The sheer extent of the Media Room’s physical interface creates a “real-space” environment. The user’s focal situation amidst an ensemble of several screens of various sizes creates a set of geometrical relationships quite apart from any purely logical relationship between any one screen’s content and that of any other. Properly orchestrated, the two spatial orders, *virtual* graphical space, and the user’s immediate *real* space in the Media Room, can converge to become effectively one continuous interactive space.

Commanding the system depended on a “space position and orientation sensing technology” located beside the chair that would interact with a lightweight, wearable “sensor cube.”

Available sensors, the report noted, were small enough as to be wearable, whether as a finger wring or on a jacket, “in lieu of cuff and collar buttons or epaulets” (these details are suggestive regarding the imagined user). The SDMS was programmed to recognize commands such as “create,” “move,” “make that,” “delete” and so on. On-screen, the objects displayed were non-representational— basic shapes, such as circles, squares, and diamonds in different colors and sizes. Where one pointed was reflected by an x-shaped cursor on screen. With location sensing, pronouns alone could suffice. Bolt suggested a possible command to explain the implications:

‘Move that to the right of the green square.’ In this option, the user employs the pronoun ‘that,’ simultaneously pointing to what is intended, the pointing act being a motor analogue to the speech string: ‘... the blue triangle.’ Notice that in this mode of giving the command, the user may not only omit the words ‘blue’ and ‘triangle,’ he need not even know what the thing is, or what it is *called*. In our simple graphics world, what anything is, is in a subtle and interesting sense, *where* it is.

This level of abstraction, while subtle and technologically interesting, also abstracted the very real command-and-control military applications that were never far from mind in the project, certainly for its defense sponsors. Bolt acknowledges this when he writes:

The foregoing rudimentary set of commands, concerning themselves with the simple management of a limited ensemble of non-representative objects, is intended to suggest the versatility and ease of use that can enter upon the management of graphic space with voice and gesture. More real-life examples of commanding about ‘things’ in a more meaningful space come readily to mind: moving ships about a harbor map in planning a harbor facility;

moving battalion formations about as overlays on a terrain map; facilities planning, where rooms and hallways as rectangles are tried out ‘here’ and ‘there.’

Of projects like these, Molly Steenson invokes Timothy Lenoir and Henry Lowood’s suggestive phrase, the “military-entertainment complex,” to describe the feedback loop between video games and military simulations, as well as Eyal Weizman’s discussion of the “civilianization” of military technologies, in which these systems enter into everyday life along with the power structures they imply.<sup>86</sup> The ease of use demanded for these systems, such that they would be intuitive to everyone from a general to a child, also implied a detachment from whatever was, in the physical world outside the media room, being controlled.

Elaborate as the media room setup was, it was also imagined as a prototype for what living with—or in this case, in—a computer might look like. When the computer moved from the workplace to the home, as Negroponte argued starting in the 1970s, users would begin to expect more from it in terms of usability and what is now broadly called “user experience.” Before the mid-1980s advent of the personal computer, as a commercially available product, Negroponte argued that the term “personal computer” was itself “unfortunate. . . . The computers about which people are talking are not really personal and in no sense personalized. Instead, they are available at sufficiently low cost so as not to have to share them.” Truly personal computers, he believed, would offer not just a variety of personalizable options, but the artificial intelligence properties to *know* their users’ preferences, habits, and intentions.<sup>87</sup> The authors of “Books without Pages” predicted correctly that

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<sup>86</sup> Quoted in Steenson, “Architectures of Information,” 269. See Timothy Lenoir and Henry Lowood, “Theaters of War: The Military-Entertainment Complex,” in *Collection, Laboratory, Theater: Scenes of Knowledge in the 17<sup>th</sup> Century*, ed. Helmar Schramm, Ludger Scwarte, and Jan Lazardzig (Berlin: Walter de Gruyter, 2005). And Eyal Weizman, *Hollow Land: Israel’s Architecture of Occupation* (London: Verso, 2007), 57.

<sup>87</sup> Negroponte, “Books without Pages” [1979], 7.

Such startling advances and cost reductions are occurring in microelectronics that we believe future systems will not be characterized by their memory size or processing speed. Instead, the human interface will become the major measure, calibrated in very subjective units, so sensory and personalized that it will be evaluated by feelings and perceptions. Is it easy to use? Does it feel good? Is it pleasurable?<sup>88</sup>

“Books without Pages,” and its place within the “Spatial Data Management” system, contemplated nothing less than early electronic books, and the on-screen behaviors and gestural interactions that would anticipate the touch-screen tablet devices of 30 years later— and perhaps wearable technologies still to come. Likewise, the metaphor of flying through information had both antecedents in earlier work at MIT, by figures such as Kepes and Lynch, and would also have implications for Cooper’s later interface design work.

“Books without Pages” was also significant for its early exploration of the implications of “soft copy.” As “the linguistic raw material of the digital age,” in Ellen Lupton’s phrase, “soft copy” also introduced a sea change in the process of design. Elaborating on the term, today uncommon, perhaps because it refers to something so ubiquitous, she writes:

The bastard offspring of hard copy, soft text lacks a fixed typographic identity. Owing allegiance to no font or format, it is willingly pasted, pirated, output, or repurposed in countless contexts. It is the ubiquitous medium of word-processing, desk-top publishing, e-mail, and the Internet. The burgeoning of soft copy had an enormous impact on graphic design in the 1980s and 1990s. In design for print, soft copy largely eliminated the mediation of the typesetter, the technician previously charged with converting the manuscript—which had been painstakingly marked up by hand with instructions from the designer—into galleys, or formal pages of type. Soft copy flows directly to designers in digital form from authors and editors. The designer is free to directly manipulate the text—without relying on the typesetter, and to adjust typographic details up to the final moments of production. The soft copy revolution led designers to plunge from an objective aerial view into the moving waters of text, where they shape it from within.<sup>89</sup>

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<sup>88</sup> Proposal, “Books without Pages.”

<sup>89</sup> Ellen Lupton, “Fluid Mechanics: Typographic Design Now,” in *Design Culture Now: National Design Triennial*, ed. Donald Albrecht, Steven Holt, and Ellen Lupton (New York: Cooper-Hewitt Museum, 2000).

Many of the behaviors that users of digital devices are now accustomed to were also worked out at this time. The authors of “Books without Pages” suggested that text on a screen that was too long to be visible within a single window not jump up to reveal a new line below, but rather scroll and render this line slowly, so that the text remains visible in the process. What would become known as “Hollywood scroll,” suggesting the cinematic metaphor of film credits rolling down the screen, is today ubiquitous. Even as the anticipated passage of physical books into obsolescence still seems premature, the metaphor of the book page remains durable in digital contexts. As Professor of English James Kalmbach observed in 1996, thinking specifically of the “web page”:

While the book as a metaphor for information storage may be losing its value, the ‘page’ as a metaphor for a perceptual or syntagmemic unit of digital display is thriving. Instead of books without pages we have pages without books.<sup>90</sup>

### **Body and/as Machine**

The intimate connection of human and machine in the postwar period, in which these projects participate, has also initiated larger questions of what it means to be human. Already from her Polaroid double-self-portrait, with the SX-70 camera as her prosthetic eye, Cooper understood herself, in certain ways, as a kind of cyborg. But this later research, of wearable devices, immersive interfaces, and gestures comprehensible to the computer, solidified the posthuman moment in which she was operating. A common theme of the posthuman, for Katherine Hayles, is “the union of the human with the intelligent machine,” and the consequent “erasure of

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<sup>90</sup> James Kalmbach, “Books without Pages/Pages without Books: Revisiting the Geography of Interface,” in Negroponte, “Books without Pages” [1979], 15.

embodiment.”<sup>91</sup> Much of the Media Lab’s research shared a basic assumption of the posthuman, as expressed by Hayles:

The posthuman view thinks of the body as the original prosthesis we all learn to manipulate, so that extending or replacing the body with other prostheses becomes a continuation of a process that began before we were born.

This logic reconfigures the idea of the humanist subject:

In the posthuman, there are no essential differences or absolute demarcations between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot teleology and human goals.<sup>92</sup>

On the other hand, much of the work done at MIT, starting with the Architecture Machine Group, was nominally oriented toward reinstating the human’s primary status, and that of the body, in relations to the machine, for example by training computers to be more responsive to language and gestures more natural to the human, rather than training the human to behave more like a computer. In this sense, some of this work could be—and was—seen as humanist in ambition, in a similar sense as Hayles describes the work of Norbert Wiener, for whom “cybernetics was a means to extend liberal humanism, not subvert it.” She adds: “The point was less to show that man was a machine than to demonstrate that a machine could function like a man.”<sup>93</sup>

Still, Cooper herself, surrounded by her various tools, whether connected to the viewfinder or the drawing tablet, was a kind of cyborg (fig. 4.12). As Donna Haraway would write in 1991, squarely in the middle of Cooper’s tenure at the Media Lab: “By the late twentieth century, our time, a mythic time, we are all chimeras, theorized and fabricated hybrids of

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<sup>91</sup> N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999), xi and 2.

<sup>92</sup> *Ibid.*, 3.

<sup>93</sup> *Ibid.*, 7.



machine and organism; in short, we are cyborgs.”<sup>94</sup> The human-computer interface takes on another meaning in this context. Indeed, the idea of the interface as a static membrane between human and machine is complicated by the progressive intermingling of the two. As Haraway notes, the relation between organism and machine has been “a border war,” and the stakes of this have been “the territories of production, reproduction, and imagination....” Haraway makes “an argument for *pleasure* in the confusion of boundaries and for *responsibility* in their construction.” Play, or at least playfulness, was indeed Cooper’s operative mode for much of this research.

### **Research Topics at the VLW**

Just as a lack of interest in designing “individual solutions” induced Cooper to create new production systems at the MIT Press, and eventually explore computers, much of her work at the Media Lab focused on the automation of “standard and repetitious tasks” through artificial intelligence. A video produced to demonstrate several VLW projects a year after the Media Lab’s opening is instructive in highlighting the group’s work, especially in creating artificially intelligent design tools. The 1986 video “Research Topics at the Visible Language Workshop” shows at the start that it was sponsored by Rudolf Hell, the German print technology company, and IBM (fig. 4.13).<sup>95</sup> As its final frame of credits shows, the video compiles the work of five masters students in the VLW (in the MSVS program), and two undergraduates, all under the supervision of Cooper and MacNeil. Interspersed with on-screen typography, Cooper is shown

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<sup>94</sup> Donna Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century,” in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York: Routledge, 1991), 149–181.

<sup>95</sup> Visible Language Workshop, MIT Media Lab, “Research Topics at the Visible Language Workshop,” 1986.

sitting in the VLW space in the Wiesner building, surrounded by computer workstations and students using them. She narrates the broader context for the VLW's work.

The VLW, Cooper explains, is focused on developing two major themes: “graphics... in the broadest sense to filter, define, and qualify information”; and second, the “interface— what the surface or access of the person to the machine can be like to promote the most creative and generative means of communication.” She describes the status quo, as the screen cuts to footage of unformatted green text against a black background, filling the display of a computer terminal: “At the moment, you have to drag yourself through this hideous wilderness of alphanumeric data that has never been filtered, graphically, in any sense. And it's tedious, and it's ugly, and it's counterproductive. It's very hard to find things.” Cooper explains that, historically, “Design has functioned in the print world as being a graphic/editorial filter.” The screen cuts to an image of the cover of F.T. Marinetti's 1914 futurist sound- and concrete-poem *Zang Tumb Tumb*, to exemplify how typography can be expressive, especially in motion.

The video then presents different VLW projects, many of them centering on problems of automation in the design process. As Cooper explains, “we've begun to... study ways in which tools can be modeled to the machine so that that the machine will then begin to assume some of the responsibility for work that is repetitive or describable.” A student is shown demonstrating a kind of desktop publishing software he developed, explaining that the “intelligent page program takes raw information and redesigns it for increased readability.” We see the same green text as before, and then see it formatted and transformed into neat columns as if in a book. The student clicks these columns and the text disappears to reveal the layout rules that underlie it. Symbolic notations worked out by the student indicate the text's alignment (in this case, flush left and ragged right), the line spacing, and the indentation of the first line of new paragraphs. As the

student explains, this text that was produced on a screen might continue to circulate in an electronic environment, be printed in hardcopy, or be read aloud by machine. Here the camera cuts to show these latter two possibilities, both of a laser jet printout of the formatted text and of a crude text-to-speech system bleating out each syllable.

Another student demonstrates a font creation and editing software, also integrating artificial intelligence. “The very design of a typeface is an important building block in a graphically filtered interface,” the narrator intones. The student then demonstrates the rapid design of letterforms: From a set of points defining curves, a lowercase “h” is created. The system can extrapolate from this letter to an “n,” essentially by terminating the ascender at the letter’s mean line. A change can be propagated, the student demonstrates, by exaggerating the shoulder, or curve of the “n,” and transforming it into a “u” (by flipping it on its horizontal axis). The student also shows other views of the same document, and its structure, allowing it to be navigated based on its different sections, as the machine is made to understand them by the use of headers and breaks. The document can also be visualized as a tree structure, or links between images and the text to which they correspond can be shown schematically. The student also shows what a digital type catalog could look like—assuming, on the off chance, that one wished to use something other than Helvetica.

The camera cuts to MacNeil, in a sponsor-friendly shirt and tie, rather than the all-denim work clothes of the VLW’s early days (it is, nevertheless, a casual, western-style shirt, with the collar unbuttoned). He explains another philosophical conviction of the VLW, a version of the shared bias on which he and Cooper first connected: “There’s a real tyranny that the current computer systems impose on the users. They are by and large not configurable.” Another student then presents his work on an interactive, 3-D product design tool for packaging. This software

simultaneously integrates 2- and 3-D views, mapping the products of a paint program, in perspective, around a wireframe volume just created. MacNeil explains the benefits of such a system of rapid feedback for the designer, by reducing a process that might have taken days or weeks—that of mocking-up prototypes with an outside vendor—into an instantaneous visualization.

Another student takes up the simple use case of creating a business card in a project which presents the computer as an intelligent design assistant. The system works by voice command, with the computer asking its human a series of questions to determine the appropriate style to apply based on a set of pre-programmed rules: “In what industry is your profession?” a computer voice asks, offering four options: “financial, advertising, art, or science?” “Advertising,” the human “client” answers, and the LED display mounted above the monitor registers that it has “heard” the response by registering it in written form. Follow-up questions further define parameters: What is the user’s role at the company? Management. The company’s financial scale? Medium. What image would you like to project? Progressive. “Please wait,” the computer announces, with a bit of programmed wit, “while I get creative.” The creative result looks strikingly like Media Lab stationery, a clean and quite Swiss, two column layout of sans serif, left justified type. Had the student said he was an “eccentric artist,” he explains, the result would have used a serified type, decorative diagonal lines, and polychrome polka dots, in this case blinking on and off as the color changes, perhaps to suggest an animated business card that might continue to circulate primarily on-screen.

Cooper concludes by explaining that the VLW’s work extends into animation and video, and the combination of computer graphics with real-time video (the end-credits show that this video was a collaboration with the Film and Video Section of the Media Lab, which facilitated

the production process.) The final part of this demonstration video, made to impress existing sponsors and garner new ones, is in equal parts technically impressive and puzzlingly eerie. The end credits identify the work as an excerpt from “Olga’s Room,” by Media Lab student Tyler Peppel. Through a combination of computer generated graphics and real-time video, we find ourselves looking at a rendered domestic scene, with the blackness of outer space visible beyond the open door. Framed pictures, some of them photographs, hang on the wall. And at the table is an androgynous and expressionless live-action human, with a rendered coffee cup and a tablet before them, painting a colorful, abstract image using a stylus. A sad, synthesized saxophone solo plays. The fenestration behind the figure is defined by thick columns for mullions, unintentionally suggesting a carceral space. The camera shifts to the outside of the room, to show the figure looking out the window, forlorn, the exterior wall rendered in gray blocks and looking even more punitive. Now looking out the door, the figure pushes a rendered red button beside it, presumably to exit. The motion freezes, and the camera zooms in once, then twice, on that finger to the point of bitmapped abstraction—the live finger as pixelated as the rendered backdrop. An impressive demonstration of combining media in real time, the general affect of “Olga’s World” could not be a more effective parable for posthuman existence as a kind of imprisonment within the architecture of the computer.

### **Design Programs**

With rules-based, artificially intelligent design software of the kind explored at the VLW, the typographic grid was given a new life. Karl Gerstner’s seminal 1964 book *Designing Programmes*, with its proto-digital, systematic approach to design, focused on accounting for all possible variables such that “The process of designing is reduced to an act of selection: crossing

and linking parameters.”<sup>96</sup> The grid played a special role in this regard, as kind of program unto itself. Gerstner wrote:

Is the grid a program? Let me put it more specifically: if the grid is considered as a proportional regular, a system, it is a program *par excellence*. Squared paper is an (arithmetic) grid, but not a program. Unlike, say, the geometric module of Le Corbusier, that can, of course, be used as a grid but is primarily a program. Albert Einstein said of the module: “It is a scale of proportions that makes the bad difficult and the good easy.” That is a programmatic statement of what I take to be the aim of *Designing Programmes*.<sup>97</sup>

The flexibility of the grid is considerable. Gerstner noted: “The typographic grid is a proportional regular for composition, tables, pictures, etc. It is a formal program to accommodate  $x$  unknown items.... The grid looks complicated to anyone not knowing the key. For the initiate, it is easy to use and (almost) inexhaustible as a program.” This thinking would regain favor in the digital age. As Ellen Lupton wrote, on the reactionary dismissal of Swiss rationalism by the more expressive modes of design that followed it: “Programmatic thinking is now being revived, however, as designers today confront large-scale information projects. The need is greater than ever for flexible ‘programs’ designed to accommodate dynamic bodies of content.”<sup>98</sup> The electronic moment, she suggests, invites a “return to universals,” in the spirit of the widely applicable visual languages pursued by interwar avant-garde designers (emblemized, for example, even in name, by Herbert Bayer’s *Universal* alphabet, circa 1927), and continued by

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<sup>96</sup> Karl Gerstner, *Designing Programmes* (New York: Hastings House, 1964). The book first appeared in German as *Programme Entwerfen* in 1963. A new English edition appeared in 2007. As publisher Lars Müller notes in this new edition’s foreword, the book “has turned out to be an extremely relevant paradigm in the digital age— even though it was written before there was such a thing.” Karl Gerstner, *Designing Programmes* (Lars Müller Publishers, 2007).

<sup>97</sup> *Ibid.*, 16.

<sup>98</sup> Ellen Lupton, *Thinking with Type: A Critical Guide for Designers, Writers, Editors, & Students* (New York: Princeton Architectural Press, 2010), 165.

post-war designers, in many cases to keep pace with the acceleration of business.<sup>99</sup> Quoting from William Gibson’s 1984 science fiction novel *Neuromancer*, in which he describes the grid “as infinite space—defying edges and dominated by the mind rather than the body,” Lupton writes that “The rise of the Internet has rekindled interest in universal design thinking.” She observes: “A second modernism has emerged, reinvigorating the utopian search for universal forms that marked the birth of design as a discourse and a discipline nearly a century earlier. Against the opacity and singularity of unique visual expressions—grounded in regional preferences and private obsessions—ideas of commonality, transparency, and openness are being reborn as information seeks once again to shed its physical body.”<sup>100</sup> These universals were meant to channel the “fluid mechanics” of “soft copy.”<sup>101</sup> Tellingly, Khoi Vinh, a graphic designer and writer, and former design director for *The New York Times*, titled his 2010 book on web design *Ordering Disorder: Grid Principles for Web Design*.<sup>102</sup> This digital-age update of Müller-Brockmann’s *Grid Systems in Graphic Design* still appeals to the eternal bad object of systems designers in its title, positing the grid as a form of discipline against the unruliness of information in a chaotic state.<sup>103</sup> Naturally, the proportional grid used by a sensitive designer, on

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<sup>99</sup> Designer Ladislav Sutnar wrote, for example: “New means had to come to meet the quickening tempo of industry. Graphic design was forced to develop higher standards of performance to speed up the transmission of information.” Ladislav Sutnar, *Visual Design in Action: Principles, Purposes* [1961] (Baden: Lars Müller, 2015), section 1/c, n.p.

<sup>100</sup> Lupton, *Thinking with Type: A Critical Guide for Designers, Writers, Editors, & Students*, 174. Lupton’s suggestion of a “second modernism” is of course quite different, in periodization and argument, than Dutta’s in *A Second Modernism: MIT, Architecture, and the ‘Techno-Social’ Moment* (2013).

<sup>101</sup> See Lupton, “Fluid Mechanics: Typographic Design Now.”

<sup>102</sup> Khoi Vinh, *Ordering Disorder: Grid Principles for Web Design* (Berkeley, CA: New Riders, 2010).

<sup>103</sup> Design reformers throughout the 20<sup>th</sup> century, whether in architecture or graphics, have inveighed against the entropic visual environment, from Kepes’s introductory observation that “today we experience chaos” to Paul Rand’s writing in *Design, Form, Chaos*. See Paul Rand, *Design, Form, and Chaos* (New Haven: Yale University Press, 1993). Kepes, *Language of Vision*, 13. Cooper was more comfortable with messiness than either of these designers, but still understood the need for systems to manage copious amounts of information.

a given object, is likelier to be successful than the procrustean system imposed by a crude software tool, but this was at least the direction in which many VLW researchers were looking.

### **Sidebar: Type on Screen**

Typography on screen was a persistent interest of the Architecture Machine Group, well before the formation of the Media Lab. The group's informal graphic design consultants in this research included Negroponte's friends from Design Services and the Visible Language Workshop, namely Cooper and MacNeil, and designers such as Coburn and Casey. One of the Architecture Machine Group's major contributions was anti-aliasing. As Ellen Lupton describes it, anti-aliasing "creates the appearance of smooth curves on screen by changing the brightness of the pixels or sub-pixels along the edges of each letterform."<sup>104</sup> Bitmap typefaces without anti-aliasing, which hew only to the grid of pixels as squares that are either "on" or "off," appear jagged along diagonal lines, which are rendered in a step-wise fashion.

Naturally Cooper is not the only important figure in the history of graphic design on-screen. Yet considering her possible peers also suggests vital differences, which place Cooper's contribution in high relief. For example, a major name in the history of graphic design for and with computers is April Greiman (b. 1948), the Los Angeles-based designer whose work became synonymous with the "New Wave" style of the 1970s, as for example in her covers for *WET* magazine. Greiman in turn pursued a digitally enabled brand of postmodernism in the 1980s (fig. 4.14). She started teaching at CalArts in 1982, where she engaged with video technology introduced there by Nam June Paik, and began working primarily with the Apple Macintosh computer upon its release in 1984.

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<sup>104</sup> Lupton, *Thinking with Type*, 73.



Like Cooper, Greiman was acutely aware of a moment of technological disjuncture presented by digital tools, and wished to explore it in depth. As Cooper also realized, this manifested in a new kind of interdisciplinarity. Eric Martin, Greiman's sometime collaborator who contributed texts to a monograph on her work, observed in his introduction that a sense of "implosion" characterized the "digital revolution," which would have "profound impact on existing disciplines, graphic design among them."<sup>105</sup> His comments deserve extended quotation:

I say "among them" advisedly, since the broad effect of this revolution is to bring many things much closer than they have been since the industrial revolution made specialists of us all: idea and realization, producer and client, creation and revision, word/image/sound/movement. In short, digital technology is no respecter of existing boundaries, whether spatial, temporal, conceptual, or professional.

Similarly, "primitive" cultures, whether ancient or contemporary, see no need to distinguish between art, science, and religion when considering an act, a thought, or an object. In their view, these are all aspects of a common meaning. As April Greiman's work illustrates, the natural bias of the new digital language is to bring processes which had become isolated into a common weave. And so the use of the word 'hybrid' in the title of this book is to suggest a reintegration not only of media but of the act of design as a whole.<sup>106</sup>

These words about integrating process and product resonate with Cooper's approach to design generally, already manifest in print, but also underlie her interest in the digital. The sense of a new landscape, of a "primitive" state full of possibility, was also one Cooper shared, as she regularly assessed new conditions while at the same time observing that everything was a work in progress, that there was "still no magic way."<sup>107</sup> The feeling of liberation from process-based constraints, of Cooper's experiments with printing, and Greiman's with computers, are reflected in Greiman's comment that "This pioneering, where you don't have an aesthetic and you don't

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<sup>105</sup> Eric Martin in April Greiman, *Hybrid Imagery: The Fusion of Technology and Graphic Design* (New York: Watson-Guptill, 1990), 10.

<sup>106</sup> Ibid.

<sup>107</sup> Muriel Cooper, "Words, Images, Tools, and Ideas," 105.

have a tradition, is both time-consuming and wonderful. To feel lost is great; there are only a few areas in this very controlled industry where you can feel that.”<sup>108</sup>

Greiman appreciated, like Cooper, that digital tools entailed a new way of working, a new kind of process. This was the feedback Cooper had spoken of, of editing in real time, and rapid iteration. “It’s so easy to edit as you go along,” Greiman noted, “that editing becomes part of the original act of creation, instead of being something ‘done later.’” Above all, she reflected,

perhaps the most profound implication for the future [is that] digital technology collapses all media into a single desktop tool speaking one digital language. It is really a single metamedium. A sound is generated, edited, and remembered as a unique pattern of the same computer “bits” (on/off electronic impulses) that describe a color, for example. This is why the generic Mac “Cut and Paste” function is so effortless. Previously separate media begin to diffuse, to merge with others. Cut a picture, paste it into a song. A word is a color is a sound is a movement. The new significant media are hybrids. The age of the specialist is replaced by the age of the dedicated generalist.<sup>109</sup>

What was needed in this setting was a different kind of designer, and namely not a designer of static graphics alone.

Like Cooper, Greiman’s vision for the future was of more responsive systems: Listing “next steps” in the digital revolution, she highlighted: “Interactivity: The ‘responsive’ graphic object; from implicit to explicit dialogue. The incorporation of real sound and movement. The screen as well as print as output.” Following this she put a name to this new multimedia context: “The ‘wholegraphic’ environment: A tentative Greiman studio term for a practical and poetic unity transcending old structures. Simultaneity replacing sequence, separation, and hierarchy. A new global language. A new global culture.”<sup>110</sup> This discussion of simultaneity and a new visual language resonated with Cooper’s thinking. Greiman was a more self-expressive, artistically

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<sup>108</sup> Greiman, *Hybrid Imagery*, 56.

<sup>109</sup> *Ibid.*, 57.

<sup>110</sup> *Ibid.*, 133.

oriented designer than Cooper; her work teemed with graphics of pixelated galaxies and elliptical quotations from Continental epistemology, as in the foldout poster for her issue of the Walker Art Center's journal *Design Quarterly* in 1986, three years before Cooper's edition of the same journal. But that is not the primary difference between them.

Greiman, unlike Cooper, started using computers with the Macintosh, upon its release as a consumer tool; Cooper, by contrast, had been working with new technology for some time, and thinking about display and input technologies and software tools. Before Greiman was impressed by the "renowned friendly Macintosh environment," Cooper was developing tools that would anticipate and inform the Macintosh, and aim to be both more robust in their capabilities and more powerful in their ability to scale to problems, for example via automation.<sup>111</sup> While Greiman made a virtue of the bitmapped, "born digital" vernacular typefaces of her era, with their low-fidelity, "primitive" sensibility, Cooper was interested in bringing the rudiments of both classical and modernist typography to the screen, and working to capture the smoothness of letterforms as they appeared in print. While bitmapped or orthogonal typefaces had a "futuristic" look as early as the 1970s, as with Wim Crouwel's seminal "New Alphabet," and were perforce rasterized on early screens, Cooper was less interested in telegraphing the aesthetic of the digital than bringing its capabilities—of dynamism, simultaneity, responsiveness—to a legible and useful on-screen experience. In other words, Greiman thought about creating individual solutions with the computer, while Cooper thought about systems; Greiman used the computer as a multimedia tool, while Cooper saw it as a primary environment, working alongside the engineers and technologists who would make it so.

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<sup>111</sup> Ibid., 55.

The introduction of personal computing into graphic design in the 1980s inaugurated what Helen Armstrong calls a “typographic renaissance,” a blossoming of new typefaces produced without the gatekeeping restrictions of expensive type foundries.<sup>112</sup> Exemplary of this phenomenon, and like Greiman’s signature style, many of these designers reveled in digital graininess. While so much about this work was different from Cooper’s, the appreciation of empowerment afforded by digital tools was consistent. As Licko and VanderLans wrote in their 1989 essay, “Ambition/Fear”:

It is now possible for one individual to take on all functions required in publishing, including writer, editor, designer, and illustrator, thus bringing together a variety of disciplines and consequently streamlining production.<sup>113</sup>

Emigre either designed or licensed several hundred typefaces during its run, making them available for purchase online. For her part, Cooper seemed mostly content with Helvetica, focusing instead on other variables in the experience of creating or consuming information.

## **Computers and Design**

Cooper’s clearest published statement on her late work was a special issue of the journal *Design Quarterly* that she guest-edited in 1989, titled “Computers and Design.” The issue revisited a topic first discussed in the journal’s 1966–67 issue, “Design and the Computer,” edited by designer Peter Seitz. That issue had featured essays on computer-aided design by the mechanical engineer Steven Coons, a mentor of Negroponte’s at MIT, among many others, and was a fairly technical accounting of the computer’s current place in art, design, and architecture. Cooper’s issue was rather more high level, divided into three parts over some 30 pages of text interspersed

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<sup>112</sup> Helen Armstrong, ed., *Digital Design Theory: Readings from the Field* (New York: Princeton Architectural Press, 2016), 14.

<sup>113</sup> Zuzana Licko and Rudy VanderLans, “Ambition/Fear,” *Emigre*, 1989.

with captioned images (fig. 4.15). These three sections were: An accounting of the so-called “new graphic languages” and their historical antecedents; a summary of the recently opened Media Lab’s work; and the current and future projects of the Visible Language Workshop in particular. The cover of the issue featured software by doctoral student Suguru Ishizaki, illustrating nine possible states of a hypothetical electronic cover for that issue, in which the size, color, position, and transparency would change based on the reader’s interests (fig. 4.16).<sup>114</sup> The back cover explains that in this work:

Each frame will change as the “reader” browses in real time with text and image cues dependent on the linkages that have been designed for browsing. On one level this series is analogous to a book printed on transparent paper, but it takes advantage of the potential for change inherent in the computer.<sup>115</sup>

Here again, Cooper has “transcoded” an electronic interface in a print setting— the journal would, after all, only ever exist in static form.

In her text, Cooper emphasized that as computers moved from mere surrogates for old tools to powerful new media, “a new interdisciplinary profession, whose practitioners will be adept in the integration of static and dynamic words and images, will be required to organize and filter information growing at an exponential rate.”<sup>116</sup> She also defined an essential shift from passive to active engagement with media, from closure and finitude to dynamism and flux:

Visual communications in the publishing and entertainment worlds, large or small, traditional or experimental, are closed and passive. The writing and designing of printed works depend on beginnings and endings and clear-cut linear and non-variable structures.

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<sup>114</sup> Ishizaki currently teaches in the Department of English at Carnegie Mellon University, where he remains focused on digital communication design. He is quoted as saying, of his initial view of the VLW as a student: “I thought that the things they were working on were often ugly; but after I talked to her [Cooper], I was converted to believing in experimental design, which I continue to believe in.” Elizabeth Glenewinkel, “Muriel Cooper’s Legacy to Design,” *I.D. Magazine*, 1996, 6.

<sup>115</sup> Cooper, “Computers and Design,” back cover.

<sup>116</sup> *Ibid.*, 4.

There is no publishing without closure. The reader's participation is limited to choosing when and where one may read or view, delve in or out, scan or flip.<sup>117</sup>

Cooper contrasts this with the multimedia nature of sound film and animation, the modicum of user control afforded by advancing a video tape to a given place, and the great level of control present in home video games.

Cooper cites the role of artists in pushing the "new graphic languages" through experimental works:

At the frontiers of expression, unencumbered by the restraints of the marketplace, artists and designers have pushed the time and space limitations of print and mass production with experimental works in limited editions. The traditions of binding, of the page, of sequence, of materials, of the package, of audience participation, have all been violated in an effort to break away from the tyranny of a fixed set of relationships.<sup>118</sup>

She approvingly cites the work of Robert Rauschenberg, naming his 1967 work *Revolver*, in which images are silkscreened on translucent rotating Plexiglas discs. Here "the time overlaps characteristic of [Rauschenberg's] previous work are achieved in real time," Cooper writes. She also praises artists for time-based performances that illuminate man's relationship with technology, from Oskar Schlemmer and Ludwig Hirschfeld Mack at the Bauhaus to Cooper's contemporaries, such as John Cage, Otto Piene, Philip Glass, and Robert Wilson.<sup>119</sup>

Cooper also surveys a series of "Design Integration Precedents and Pioneers." In her sweeping historical summary, "The Bauhaus, the Futurists, the Russian avant-garde, the Dadaists, the Surrealists, and the performance artists of the 1950s Happenings all explored the

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<sup>117</sup> Ibid., 13.

<sup>118</sup> Ibid., 7.

<sup>119</sup> Ibid., 16. Cooper refers erroneously to "Oskar Schlemmer's *Ballet Mécanique* (1923)," citing the film of 1924 that was directed by Fernand Léger. Schlemmer's *Triadic Ballet*, however, was also a consistent point of reference.

synthesis of communication media for a more interactive experience.”<sup>120</sup> Cooper praises Moholy-Nagy—whom she had elevated to heroic scale in her posters for *The Bauhaus*, and whose readings she assigned her students for years while teaching—for his “holistic vision” and exploration of “the static and dynamic aspects of photography and the cinema, and their relationship to text.”<sup>121</sup> She singles out one project of Moholy’s in particular:

His diagrammatic notational score for the *Dynamic of the Metropolis* explores visual and verbal means of interrelating the different time frames of sound and moving image in the print medium. In fact, the score itself becomes a piece of meta-art.

Cooper adds her own contention: “It is not hard to imagine Moholy using a computer.”

Gyorgy Kepes, who had recommended that Cooper be hired at MIT, is also praised for his *Language of Vision*, and other writings “on the interconnectedness of art, technology, and design.” Cooper mentions Charles and Ray Eames, and especially their multimedia, experiential designs, such as the “Sample Lesson” they created with George Nelson, a classroom experience that combined still and moving images with sound and even olfactory stimuli. Cooper also pays homage to Karl Gerstner’s *Designing Programmes*, “which explores the structure of design as programmed systems and resultant processes rather than as unique product.”

In the first sentence of her brief gloss on the Media Lab, the organization is described, audaciously, as “a pioneering interdisciplinary center that is a response to the information revolution, much as the Bauhaus was a response to the industrial revolution.”<sup>122</sup> Whether this analogy originated with her or Negroponte is unclear, but it is telling for reasons described earlier as well as the observation that followed two pages later:

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<sup>120</sup> Ibid., 14.

<sup>121</sup> Ibid. along with following two quotations.

<sup>122</sup> Ibid., 18.

The Media Lab's greatest strength may prove to be the collision of the disparate disciplines and values represented there. The valuation models of a scientific community do not easily mesh with those of the art community although they avowedly seek the same grail. In much the same way, the meaning of the Bauhaus was in the conflict between painters like Klee and Feininger, and technocrats like Moholy-Nagy.

Whether the latter cultural conflict, between artists and technologists, in fact defined “the meaning of the Bauhaus”—there is a case to be made that it did—it is a productive interpretation of some of the frictions that emerged within the Lab.

Many of the projects Cooper goes on to describe at the Media Lab are based on the idea that, unlike media which have historically placed the audience in a passive role, the computer can give them an active role, and even act as a “surrogate,” able to understand the user's preferences and filter content accordingly. This idea is illustrated on the following page with “NewsPeek,” Walter Bender's concept for a personalized newspaper interface. Cooper also highlights Seymour Papert's computer learning program for K–6 Boston students, called LEGO/Logo, which combined the Logo software with networked LEGO parts, and older achievements in anti-aliased typography “pioneered by the Media Lab in 1972” (of course, the Lab did not yet exist at that time, but Cooper is referring to its antecedent, the Architecture Machine Group). Synthetic holography by Media Lab faculty member Steven Benton is also shown, as are stills from an animation comprised of mathematically rendered abstract creatures modeled on the natural movement of worms— of little interest aesthetically, but of great interest computationally.

The issue's final section, on the Visible Language Workshop, begins with an axiomatic premise: “In an electronic environment, the volume of real-time information will outstrip our ability to process it.” Cooper continues: “The use of graphics as a filter for this complex information, as a means of making it both meaningful and expressive, is the critical research challenge of the Workshop.” Under a picture of herself at a three-screen workstation, Cooper



predicts that “the tools to generate graphics will eventually include sound and video in a seamless fashion, and all of the elements will be linked together in real time.”

The number of projects represented here by one student in particular, David Small, indicates his major importance at the VLW during this time. A wunderkind mentee of Cooper’s, Small started at the VLW as an undergraduate at MIT, in 1986, before continuing on to receive a masters degree from the Media Lab under Cooper’s supervision, and then his doctorate. Showing one of his projects, Cooper predicts that “high-resolution translucent text and images will be a part of [computer] environments.” By way of another project by Small, *The Fundamentals of Color* (1987–88), described as “an electronic book that demonstrates the use of dynamic interactive, mathematical illustrations,” Cooper again indicates the possibilities of translucency, in this case to transition smoothly from English to German versions of a given text. A color palette software to manage the enormous range of available colors on-screen is also by Small, and an “Intelligent Color Editor” is by fellow student Suguru Ishizaki.

Cooper elaborates on the importance of automatic layout for the design process going forward. “Designers,” she asserts, “will simply be unable to produce the number of individual solutions required for the vast number of variables implicit in real-time interaction. Design will of necessity become the art of designing processes.” She shows a software program, “Grub Attack,” by Ron MacNeil, created with rules-based artificial intelligence, and one called “Perspectives” that uses artificial intelligence to layout pictures within a grid. “The constraints of the grid limit the machine’s proposals,” Cooper notes, “which are remarkably acceptable.” The text concludes by discussing long-range research. One of the projects shown is of “smart typography,” that adapts to its background, appearing either darker or lighter, to “maintain legibility over an unpredictable, changing background.” Two animated frames, showing what

appear to be kitschy and cartoonish, utterly un-designed images, in fact show two different approaches to computer graphics: one is drawn using a computer animation program, with each 3D object created individually, while the other was made mathematically, with a computer script that reflects the known behaviors of the insect depicted. The underlying distinction is not immediately clear in print, or from the forms' appearance; but it is another case in which process is central to Cooper's interest.

In one of her only admissions on the subject, Cooper airs her concern about the “inevitable Jekyll-Hyde syndrome” associated with “government and industry” support of artificial intelligence research. She duly predicts that the computer will continue to “evolve from a set of tools for traditional design tasks into a valued assistant that can learn from its mentor.” “Visualization and graphic manipulation of information, interface, and interactive design will be valued not as cosmetics, but as vital necessities in an information society.”<sup>123</sup>

### **Typographic Space**

Small and Ishizaki, as doctoral students at the VLW, demonstrated some of their work on three-dimensional typography at the April 1994 CHI (Human Factors in Computing Systems) conference in Boston. To accompany it, they co-authored a paper with Cooper called “Typographic Space.”<sup>124</sup> The work was made possible by the great processing power of a Silicon Graphics “Onyx” workstation computer that had just arrived at the Lab. Their paper argued that interactive, three-dimensional graphics could be “effective in visualizing a large and complex

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<sup>123</sup> Ibid., 30.

<sup>124</sup> David Small, Suguru Ishizaki, and Muriel Cooper, “Typographic Space,” *Conference Companion: CHI '94, Boston, Massachusetts*, April 24, 1994.

information space,” and that the concerns relevant in a three-dimensional electronic environment were unique. “Typographic Space” was, in essence, an “experimental software tool”; as Small later recalled, “we weren't looking at applications,” but “always thought it would be part and parcel of an operating system.” He described the goals for such an interface in clear terms, and in contrast to prevailing metaphors for interaction: “We pushed to never have a window.”<sup>125</sup>

Small and Ishizaki’s brief paper set out to identify some of the opportunities and challenges of three-dimensional typography. Beyond a literal, functional message, typography could also be expressive, the authors suggest, and “express a subtle visual style.” “The best example of expressive typography,” they write, is visible in cartoons, where “rich sets of emotional quality and tone of voice are represented by typography.”<sup>126</sup> Cooper, for her part, had long praised cartoons for their communicative style, and even showed them in her slide lectures. Winsor McCray’s 1910 cartoon *Little Nemo*, its frames choked with overlapping speech and thought bubbles bustling for priority, was shown full page, as the second image in Cooper’s issue of “Computers and Design” as an example of simultaneity: “Its multiple voices and serial images bridge time and space and use typographic size, style, and placement to simulate sound and expression.”<sup>127</sup>

Typical of the kind of work done in Cooper’s VLW, Small and Ishizaki aimed to “apply typographic techniques developed in two-dimensional graphic design to the design of three-dimensional information graphics.” The interface they used was a mouse and keyboard: “the mouse is used to change view distance and eight keys are assigned to set rotation, translation of

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<sup>125</sup> David Small, interview by author, telephone, December 13, 2011.

<sup>126</sup> Small and Ishizaki, 437.

<sup>127</sup> Cooper, “Computers and Design,” 6.

viewpoint.”<sup>128</sup> Three unique problems applied to typography in three dimensions, according to the authors. First, by allowing the user to move around freely in space, letterforms might be distorted and therefore less legible, whether because they are viewed from the side, and thus appear simply as a line; because they might disappear entirely, depending on their thickness; or because they appear in reverse, when viewed from the other side. Simultaneously privileging both the user’s agency in moving around a space and the legibility of the type was therefore difficult.

Second, the relative size of type, normally a factor that a designer might vary to convey emphasis or hierarchy, was less clear in a perspectival space through which a user can move. (This problem might be alleviated somewhat, the authors suggest, through stereoscopic display, that is, with each eye seeing a separate image, to be combined in the brain.) Finally, the factor of motion suggested promising avenues. Graphics on screen could engage a temporal dimension (blinking and flashing are mentioned), and three-dimensional space offered even fuller possibilities, along with some challenges, such as the correct rate of movement to maintain legibility.

As the paper notes, the research was undertaken at the VLW “under the direction of Professor Muriel Cooper”; i.e., Cooper was acting here in the supervisory role that would be standard for her at the Media Lab, rather than as designer of the software as such. The research was sponsored in part, the paper notes, by ARPA, NYNEX (a large telecommunications company serving New England that was eventually acquired by Bell Atlantic), Alenia (an Italian aeronautics company), and JNIDS, the acronym describing the federal government’s Joint

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<sup>128</sup> Small and Ishizaki, 437.

National Intelligence Development Staff. The diversity of these sponsors suggests the wide applications contemplated for this interface.

One of Small's electronic reading experiments at the Lab, called "The Talmud Project" (1998–9), took that expansive set of writings on Jewish custom and law and set it into relationship with the Torah on which it comments, and the modern writings of Emmanuel Levinas, which comment upon it. Given the complex interlinkages between these texts, it seemed fitting material for Small; he quotes in his text on the project a guide to Talmudic studies that advises that scholars "Get used to having many volumes of books out at one time."<sup>129</sup> On-screen, Small proposed transparency, motion, and hyperlinking to facilitate the process of study. "Layering," he wrote, "is defined as the simultaneous display of two or more information objects within the same two-dimensional space of the projected display surface." Whichever layer is of interest here would be frontmost and in focus, while the others would remain within reach just behind it.

Indicating relationships within and between texts was a major focus for Small, who made inventive provisions for reading two forms of the same text simultaneously, such as a translation and a text in its original language. In order to read Levinas in the original French, for example, Small allowed the reader to turn a dial on screen so that the leading, or space between the lines of English text, would increase, such that the original French could appear in a secondary color between these lines for direct comparison (fig. 4.17). Likewise, linkages between two points in a text could be dramatized by the simulated behavior of a spring, snapping back and forth between them. Animation could also illustrate the distance between two points in a text; for example, the

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<sup>129</sup> David Small, "Rethinking the Book," in *Graphic Design & Reading: Explorations of an Uneasy Relationship*, ed. Gunnar Swanson (New York: Allworth Press, 2000), 192. (Small quotes from Judith Abrams, *Learn the Talmud: How to Use the Talmud* (Northvale, NJ: Jason Aronson, Inc., 1995.)

initial point would not simply disappear, and yield to the next one, but the viewer would travel from one to another, maintaining a sense of place, distance, and relationship (the interaction is analogous to the difference, today, between using Google Maps and Google Earth, in which the latter zooms out from the starting point, “travels” to the end point, and then zooms back in).

### **Information Landscapes**

The work behind “Typographic Space” evolved into the project for which Cooper is best known, and also her last. “Information Landscapes” extended the ideas of “Typographic Space” and repackaged it using the more vivid metaphor of landscape (fig. 4.18). Cooper first presented “Information Landscapes” at the 5<sup>th</sup> TED (Technology, Entertainment, Design) conference in Monterey, California in February of 1994. Richard Saul Wurman, the founder of TED, who trained and worked briefly as an architect, and helped popularize the term “information architecture” starting in the 1970s,<sup>130</sup> knew Cooper from her days at the MIT Press, where she had published some of his earliest books.<sup>131</sup> Their friendship continued through her years at the Media Lab, and Wurman invited Cooper to present on her work almost a decade after the opening of the Lab.

The mythology surrounding Cooper’s presentation is now considerable, but the story goes that she had nothing prepared when she arrived in California, and delayed her presentation

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<sup>130</sup> Steenson, “Architectures of Information,” 14 passim.

<sup>131</sup> One of the earliest and most popular of these was Richard Saul Wurman, *Yellow Pages of Learning Resources* (Cambridge, MA: MIT Press, 1972). Cooper’s involvement with the book seems to have been minimal or non-existent, but perhaps the most seminal of Wurman’s books, and certainly the largest, was Joseph Passonneau and Richard Saul Wurman, *Urban Atlas: 20 American Cities: A Communication Study Notating Selected Urban Data at a Scale of 1:48,000* (Cambridge, MA: MIT Press, 1966). The book was “a preliminary investigation of visual systems of programming information for metropolitan-scale design.” It allowed major American cities to be compared on different demographic indices using a graphical system of color coded circles and squares (whose abstraction also made it appear to be machine readable).

until the final day, working feverishly with Small until then.<sup>132</sup> Finally, on the day of her talk, after sitting down and removing her shoes, Cooper and Wurman began a meandering conversation (strict time limits and polished patter were not yet a staple of TED) before a live presentation of the work began, controlled by Small using a mouse and keystrokes.

Various versions of the presentation exist, including one, later repackaged with voiceover narration explaining the concept, and quoting Cooper as saying “Information is of little use if you can’t find your way through it.” This version assembles various pieces of work within the demo, including “Financial Viewpoints” by Lisa Strausfeld. Strausfeld, who had initially trained as an architect before coming to the Media Lab, let viewers fly around and zoom into tabular data in three dimensions, with new indices displaying as one drilled into or out of the visualization. There was also a news reader by Yin Yin Wong, an air traffic control simulation, and others, all controlled by the same fly-through metaphor.

While typography in perspective or 3D might have resembled some film title sequences in certain respects, the fact of this being a real-time interface, in which the viewer was also a user—not passenger but pilot—was quite new, and, Small suggests, impossible without the processing power of the equipment the Workshop had recently acquired.<sup>133</sup> The “content” of demos like “Typographic Space” was of course filler—the names of the Media Lab’s students, faculty, and research groups (in this sense, it was a bit like film credits, or akin to a three-dimensional slide presentation on the VLW, in which the medium was the message). Whether

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<sup>132</sup> Richard Saul Wurman, interview by author, telephone, February 14, 2012. It seems likely that the story has been exaggerated somewhat in the meantime to embellish the heroics of Cooper’s presentation.

<sup>133</sup> Small, interview.

the interface was appropriate to the specific information moving through it was a separate question; in 1994, it was understood as a proof of concept.

“Information Landscapes” relied on direct manipulation, that is, the user could engage with the objects on screen without intermediate surrogates, and it also dispensed with the conventional WIMP (windows, icons, menus, pointing device) accoutrements then, as now, expected in a user interface. Finally, it transcended what had been presumed to be the flatness of the screen. In 1991, three years before the demonstration, media scholar J. David Bolter had observed the limitations of the existing system of computer windows:

If the windows contain different texts, say in two chapters in a book, the reader can move back and forth adding to and cutting from each. This new typographical space is sometimes said to have two and a half dimensions, because the writer looks straight down on the stack of planes. The writer cannot move around or behind the planes in a full third dimension, although this may well be possible in the next generation of computer software.<sup>134</sup>

Of course, soon after his writing, “Information Landscapes” presented the possibility of this third dimension.

Yet while gestures like pinching, pulling, and swiping do help users today to navigate their way through some full-screen, “immersive” applications, the broader ideas of “Information Landscapes” remain in many ways roads not traveled in interface design. Bolter’s later coinage, the property of “immediacy,” as a kind of direct access to objects beyond the interface—in contrast to “hypermediacy,” in which the user is constantly reminded of the medium—is the related and essential property of Cooper’s demonstration.<sup>135</sup> Even in 2001, graphic designer and

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<sup>134</sup> Jay David Bolter, *Writing Space: The Computer, Hypertext, and the History of Writing* (Hillsdale, NJ: Lawrence Erlbaum, 1991).

<sup>135</sup> Jay David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge, MA: MIT Press, 1999), 83 *passim*.



educator Jessica Helfand questioned the still-pervasive assumption of the screen's flatness, asking "where is the avant-garde of new media?"<sup>136</sup>

Space on the screen is just that: on the screen. Not in it. Not of it. Design tools are mere control mechanisms perpetuating the illusion that Internet space is made up of pages, of words, of flat screens. Why is it that design thinking remains so brainwashed by this notion? The world of the internet is its own peculiar galaxy, with its own constellations of information, its own orbits of content. And it is by no means flat.<sup>137</sup>

Cooper's demonstration was received with tremendous enthusiasm. Bill Gates, presenting his own work at the conference that year, was said to have asked Cooper for a copy of hers.<sup>138</sup>

Wurman recalls being moved to tears by the TED presentation, and waxes poetic about the experience of flying through information as a "waking dream."<sup>139</sup> He dedicated his 1996 book *Information Architects* to Cooper, with an extended description of the presentation as a "real-time display of heavenly navigation."<sup>140</sup>

Cooper went on to demonstrate the breakthrough work to several sponsors in the months following TED, and after presenting it in Cambridge, England, she returned to appear at a sponsor dinner in Boston, for the Department of Defense. There she died suddenly, apparently of a heart attack, on May 26, 1994. In a statement drafted on Cooper's behalf, after she was posthumously awarded the 1994 Chrysler Design Award, Negroponte wrote, with reference to this final work: "She has broken the flatland of overlapping rectangles with the idea of a galactic

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<sup>136</sup> Jessica Helfand, *Screen: Essays on Graphic Design, New Media, and Visual Culture* (New York: Princeton Architectural Press, 2001), 35.

<sup>137</sup> *Ibid.*, 37.

<sup>138</sup> Nicholas Negroponte, interview by author, telephone, December 14, 2011.

<sup>139</sup> Wurman, interview.

<sup>140</sup> Richard Saul Wurman, *Information Architects* (Zurich: Graphis Press Corp, 1996).

universe.”<sup>141</sup> “Information Landscapes” shocked everyone who saw it for its metaphor of the “cockpit windshield,” as Janet Abrams put it in a text on Cooper, written on the occasion of her posthumously receiving the AIGA (American Institute of Graphic Artists) medal in 1994.<sup>142</sup> “Information Landscapes” was acquired by the Museum of Modern Art’s Department of Architecture and Design in 2016, as the first work by Cooper or the Visible Language Workshop in the collection, and first displayed there from May 13–June 12, 2016.

### **A New Kind of Designer**

In 1991, a Yale School of Art MFA student in graphic design conducted interviews with leading designers in the field as part of her thesis project, “The Gendered Self in Graphic Design: Interviews with 15 Women.”<sup>143</sup> As one of the 15, Cooper discussed her peculiar position at MIT, as “the only woman faculty member in a group of practicing architects, as well as the only graphic person on a faculty, and then the only tenured faculty member in all of MIT that is female and deals with graphic design.” She added: “There is plenty of baggage that goes along with that position.” In this rare comment on gender politics, she concluded: “It is awful being a woman in that kind of environment, and you just kind of have to move along.”<sup>144</sup> Cooper’s otherness in this context was overdetermined, as an artistically trained, non-technical, Jewish

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<sup>141</sup> Nicholas Negroponte, “Design Statement on Behalf of Muriel Cooper,” presentation at the Chrysler Design Awards (1994).

<sup>142</sup> Abrams, “Muriel Cooper: 1994 AIGA Medal.”

<sup>143</sup> Fairbairn, “The Gendered Self in Graphic Design: Interviews with 15 Women,” n.p.

<sup>144</sup> Ibid, n.p. The notion that gender inequity might be a relic of the past in the design world is refuted by Gerda Breuer and Julia Meer in the introduction to their edited volume *Women in Graphic Design = Frauen und Grafik-Design: 1890–2012* (Berlin: Jovis Verlag, 2012), 39 (the book also includes an entry on Cooper, p. 425). They write: “Under the current social contract and its banner of neoliberalism, relations between the sexes have purportedly been modernized, and consequently, there is a perception that the old goals of radical feminism have long been integrated.” That this could possibly be the case in the technology sector is belied by daily news reports.

woman, nowhere near as buttoned up as her colleagues, in speech—she minced few words and made many jokes—and dress, with her loud and clashing caftans and informal bearing. It was a hallmark of hers to remove her shoes in meetings, and place her bare feet up on the table (fig. 4.19). The move appears to have been strategic, making her more comfortable as well as more powerful. A colleague recalls Cooper removing her shoes in a sponsor meeting with IBM and the room falling silent, as she won everyone’s full attention, and proceeded to control the meeting.<sup>145</sup>

Cooper also seems to have been in control of her career. Fairbairn asked her as a general question how many years she had been working as a designer. Cooper’s reply, in this last phase of her career, was telling: “I don’t design as such any more, I deliberately stopped being a graphic designer.” Speaking of her decision to begin the VLW, she elaborated: “I could not understand design in a clean way while still trying to solve peoples’ problems. So, I made a deliberate choice not to take on existing design problems but to get my mind out of that set.”<sup>146</sup> Cooper’s impatience with repetitive processes and growing interest in systems led her to stop designing in a traditional sense, and instead to educate a new kind of designer, and create new kinds of design tools.

The arc of Cooper’s career would be a model for larger changes to come in the graphic design profession. Designer Khoi Vinh (b. 1971), for example, has reflected eloquently on the changing nature of his field, in comments that are worth quoting at length:

The design world that I came up in—the graphic design industry at the end of the last century—was fundamentally about fashioning *messages*: ornamenting and embellishing content so that a core idea, product, or service could be more effectively consumed.<sup>147</sup>

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<sup>145</sup> Dietmar Winkler, email to author, November 27, 2017.

<sup>146</sup> Fairbairn, n.p.

<sup>147</sup> Khoi Vinh, “Conversations with the Network,” in Helen Armstrong, ed., *Digital Design Theory: Readings from the Field* (New York: Princeton Architectural Press, 2016), 126. Originally published in Paola Antonelli, ed., *Talk to Me: Design and the Communication Between People and Objects* (New York: Museum of Modern Art, 2011).

This was, to a large extent, also the design world in which Cooper came up, with its big names, signature designers, and often conspicuously signed works (one thinks of Paul Rand):

The predominant notion of how design worked was this: every design solution was the product of a visionary who birthed and nurtured an original idea, a radical insight, or an inspired revision. The designer gave it life and labored over it, so that the original inspiration evolved into a complete and definitive work. There was no design without the designer.<sup>148</sup>

Vinh’s design heroes were “storytellers” who were “at the frontiers of design authorship.” But in the digital world, he argues, “designers are critical not so much for the transmission of messages but for the crafting of the spaces within which those messages can be borne.”<sup>149</sup> Speaking to precisely the kind of non-linearity Cooper prized, he notes that the “designer as author,” whose job it was to craft messages with a “beginning, middle, and end” was less relevant “in a space in which every participant forges his or her own beginning middle and end.”<sup>150</sup> In this context, “the narrative recedes, and the behavior of the design solution becomes prominent. What becomes important are questions that concern not the author but the users. How does the system respond to the input of its users? When a user says something to the system, how does the system respond?” He contrasts the old model of mass communication, from one to many, to the many-to-many model of the present, facilitated by the World Wide Web and social media platforms. That is, it is not just the tools that are now different, it is the entire ecosystem:

Digital media is not a printing press; it does not yield publications but objects of a new kind—some people call them *products* a decidedly commercial (and not altogether unobjectionable) term, but I prefer *experiences*. The great experiences of this new medium

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<sup>148</sup> Ibid., 127.

<sup>149</sup> Ibid., 126.

<sup>150</sup> Ibid., 128.

have no beginning, middle, and end; there is no narrative arch for Google, no measurable breadth for Facebook, no climactic resolution for Twitter.<sup>151</sup>

“These experiences,” Vinh writes, “exist as a continuum.” The sense of flux and openness which Cooper values is the status quo in the digital age:

To design these systems is to anticipate what cannot be planned, to create a framework in which the unexpected can be expected to happen. The designers’ job is not to execute the vision of one person but to establish the conditions under which rich, rewarding conversation can happen.

Just as Cooper wished for the design process to be “as fluid as possible until the last possible moment,” that moment could now be extended indefinitely. Vinh writes:

Design solutions can no longer be concluded; they’re now works in progress, objects that continually evolve and are continually reinvented. A designer creates a framework for experience, the user conducts experiences within that framework, and through feedback both explicit and implicit—the designer is expected to progressively alter that experience to reflect the user’s usage patterns, frustrations, successes, and unexpected by-products.<sup>152</sup>

In this new context, the designer gets feedback from his or her tools, but also from the user’s experience, which, to an extent greater than Cooper may have imagined, feeds back quickly into the development of these tools with every successive update and tweak.

Several technologies developed in Cooper’s Visible Language Workshop were published, patented, spun off, knocked off, or the subject of new tech ventures. The most durable products of her tenure at the VLW, however, were her legion disciples— artists, designers, and technologists who carried many of her principles forward. In addition to artist-designers who encountered Cooper in the 1970s, there are also the hybrid computer scientist/designers she supervised in the 1980s and 90s, many of whom went on to found their own companies. There are also those who never met Cooper, but worked in her legacy. Ben Fry, founder of a data visualization company and author on information design, recalls that as a senior at Carnegie

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<sup>151</sup> Ibid., 129.

<sup>152</sup> Ibid., 131.

Mellon University, his professor, former VLW student Suguru Ishizaki, brought David Small and John Maeda to speak. These speakers illuminated a possible bridge between Fry's interests in graphic design and programming.<sup>153</sup> Fry went on to study in MIT's program in Media Arts and Sciences under Maeda, who then held the title "Muriel Cooper Chair" and led the Aesthetics + Computation Group (ACG), carrying on some of Cooper's interests in art and technology.<sup>154</sup> One of his major contributions, with Casey Rheas, is to have created in 2001 the popular software program "Processing." As Fry recently explained, Processing

seeks to make it easier to merge [the] disciplines of design and code. It is a direct descendant of coding libraries that date to the VLW, plus the pedagogical side of what we did at the ACG, and finally, the desire to sketch with code—writing short programs that are easily iterated upon, the same way you work with an idea in your sketchbook. The VLW name even lives on as the font format used by Processing [.vlw], which stores information in exactly the same way as the type used in the Information Landscapes demo.<sup>155</sup>

Fry added, channeling the hybrid spirit of the VLW:

Millions of users later, we have a mission statement for the Processing project, which reads "Processing seeks to ruin the careers of talented designers by tempting them away from their usual tools and into the world of programming and computation. Similarly, the project is designed to turn engineers and computer scientists to less gainful employment as artists and designers."

And I hope that point would resonate with Muriel. After she took a class with Nicholas Negroponte, she's quoted to have said the code on screen "didn't make any goddamned sense...." I've always felt that these are precisely the people I want to bring into the field. The technically inclined will find their way regardless, but they'll also make things that suit their more technical interests. A field gets interesting, however, and only truly evolves, when it expands by bringing in people with different kinds of abilities and experiences.

"There is still no magic way," as Cooper said, but the ranks of "Sunday Painters" today continue to grow, and their work is improving.

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<sup>153</sup> Ben Fry, "Muriel Cooper," *Ben Fry* [blog], October 20, 2017, [https://medium.com/@ben\\_fry/these-are-remarks-i-prepared-for-a-panel-at-a-media-lab-event-celebrating-the-life-and-work-of-6e508da100f5](https://medium.com/@ben_fry/these-are-remarks-i-prepared-for-a-panel-at-a-media-lab-event-celebrating-the-life-and-work-of-6e508da100f5).

<sup>154</sup> See Ben Fry, "Computational Information Design." Ph.D diss., Massachusetts Institute of Technology, 2004.

<sup>155</sup> Fry, "Muriel Cooper."

## **Conclusion**

### **Categorizing Cooper**

How, in the end, might one categorize Cooper, or pinpoint her specific contribution across varied activities of design, teaching, and research? She was not a meticulous typographer, a technical wizard, or a singular genius acting alone. Rather, she worked quickly, her interests were conceptual, and she collaborated extensively with those around her. In addition to her own design work, Cooper was a kind of connector figure, forming a nexus for new thinking in art, design, architecture, and computation, early on at the MIT Press and later at the Media Lab. And she was a cultivator— of ideas, people, and environments. Cooper helped cultivate a design culture at MIT, setting organizations in motion and empowering others, many of them women, to continue them. She extended her knowledge of print media—and criteria of aesthetics, usability, and even pleasure—into an uncertain digital future, prescribing how it might look and feel. Cooper mentored scores of people, and many young women, in making, experimentation, and self-expression in an environment dominated by technically minded men. And she cultivated environments, whether the design studios she helmed or the Visible Language Workshop, which others found generative, both for making prints and for writing programs. Much of this work was administrative or affective labor, a kind of care, and could be underrated compared to patriarchal models of authorship or virtuosic making. But it is also what multiplied Cooper's impact so greatly, with generations of students inspired by her thinking and her example. Finally, Cooper was, late in life, a kind of public intellectual, opining on the future of communications media. Each of these roles was interrelated, and built upon the others.

## A “New History of Modern Culture”?

In this project, I have tried to write the history of a peculiar kind of designer, working mainly in new media, and to do so from a perspective most closely aligned with art history. The fit is not a natural one. Lev Manovich has asserted, in a claim that applies to the art market as well as to the discipline of art history with which it is imbricated, that “the logic of the art world and the logic of new media are exact opposites.”<sup>156</sup> In describing these respective logics, he touches on several of the issues addressed in this project:

The first is based on the romantic idea of authorship which assumes a single author, the notion of a one-of-a-kind art object, and the control over the distribution of such objects which takes place through a set of exclusive places: galleries, museums, auctions. The second privileges the existence of potentially numerous copies; infinitely many different states of the same work; author-user symbiosis (the user can change the work through interactivity); the collective; collaborative authorship; and network distribution (which bypasses the art system distribution channels).<sup>157</sup>

This being said, I have tried to apply an art historical approach to the objects of new media, hopefully mitigating the force of Manovich’s claim.

The new media detailed in this project conform with Manovich’s description, especially in their “variability”—a useful concept he has described elsewhere to denote the on-demand nature of new media and thus the multiple forms they can take, each specific to its user or platform.<sup>158</sup> Manovich sees a politically emancipatory valence to this post-industrial shift from the conformity of mass production to the individual self-expression possible through new media. Yet he also tends to minimize or ignore the aspects of centralization, control, monetization, and surveillance that have come to accompany these technologies.

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<sup>156</sup> Lev Manovich, “New Media from Borges to HTML,” in *The New Media Reader*, ed. Noah Wardrip-Fruin and Nick Montfort (Cambridge, MA: MIT Press, 2003), 14. At the same time, even the “old media” objects discussed in this project mainly exist in unlimited series, were collaboratively made, and are of little or no market value.

<sup>157</sup> Ibid.

<sup>158</sup> Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2002), 4.



As a kind of corrective to the situation he identifies, Manovich prescribes a re-writing of art history, namely one that elevates the 20<sup>th</sup> century pioneers of new media to a status equal to or above the artists of media technologies only as new as the 19<sup>th</sup> century. Naturally, the recency of a medium is not the criterion of an artwork's success, but Manovich suggests that these unsung figures have in fact extended or achieved some of the aims of their contemporaries:

In the last few decades of the twentieth century, modern computing and network technology materialized certain key projects of modern art developed at approximately the same time. In the process of this materialization, the technologies overtook art. That is, not only have new media technologies—computer programming, graphical human-computer interface, hypertext, computer multimedia, networking (both wired-base and wireless)—actualized the ideas behind projects by artists, they have also extended them much further than the artists originally imagined. As a result, these technologies themselves have become the greatest art works of today.<sup>159</sup>

From this claim, he reasons that “the greatest interactive [art] work is the interactive human-computer interface itself,” and likewise that “the greatest avant-garde film is software such as Final Cut Pro or After Effects.” While these claims of quality are bold, and conflate artistic object and designed medium in ways that are provocative if somewhat reductive, a focus on these histories is nevertheless important. Manovich asserts: “Those computer scientists who have invented these technologies—J.C.R. Licklider, Douglas Engelbart, Ivan Sutherland, Ted Nelson, Seymour Papert, Tim Berners-Lee, and others—are the important artists of our time, maybe the only artists who are truly important and who will be remembered from this historical period.”<sup>160</sup>

He therefore calls for

a radically new history of modern culture—a view from the future when more people will recognize that the true cultural innovators of the last decades of the twentieth century were interface designers, computer game designers, music video directors and DJs—rather than

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<sup>159</sup> Manovich, “New Media from Borges to HTML,” 15. Manovich has also argued for the outgrowth of new media from the perceptual and methodological innovations of the interwar avant-garde. See Lev Manovich, “Avant-Garde as Software,” 1999, <http://manovich.net/index.php/projects/avant-garde-as-software>. And Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2002).

<sup>160</sup> *Ibid.*, 16.

painters, filmmakers, or fiction writers, whose fields remained relatively stable during this historical period.<sup>161</sup>

Without going so far as to make this latter claim, this project has aimed to redress the history somewhat, less by adding another “innovator” to the new media canon than by exploring a context and series of questions through one individual and set of objects. In writing an art history, in particular, I have likewise been motivated by the cautionary note of John Harwood, who warns that “art and architectural history all too often remain mired in the institutional imperatives toward aestheticization, fixing machines as objects rather than as apparatuses, as images rather than as interfaces.”<sup>162</sup> After all, the interface is much more than an image. As Harwood writes, “the interface produces the virtual; that is, it produces a misleading and seductive surface.”<sup>163</sup>

### **New Problems?**

Cooper would today be in her 90s. Her unexpected death coincided with the height of her fame in design and technology circles, and inspires the thought experiment of how she might have continued her career. In 1991, she mused: “I used to say, I changed careers every seven years like a locust.”<sup>164</sup> At this rate, Cooper might have had at least two more acts. Her impatience with repetition propelled her to seek out new problems, as did her own tendency to self-obsolete, whether by designing herself out of the traditional role of designer through systems—of software

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<sup>161</sup> Ibid. Manovich has historicized many of these figures in his work. See, for example, Lev Manovich, *Software Takes Command* (New York: Bloomsbury, 2013).

<sup>162</sup> Harwood, *The Interface*, 224.

<sup>163</sup> Ibid., 227.

<sup>164</sup> Janet Fairbairn, “The Gendered Self,” n.p.

and people—or by setting a pedagogical environment in motion, to be refreshed by younger generations. It is also possible that Cooper might have turned—or returned, given her education—to fine art, taking up the (video) camera or even the pen, perhaps to develop the quite accomplished doodles she made in MIT meetings, mostly of other attendees or imagined cats at play. It is also possible that she would have begun to use the digital design tools developed at the VLW to paint, collage, or animate. A late-career turn to art would follow an established path for many designers of Cooper’s generation, intent on acting as their own clients, assuming the role of author, pursuing personal expression, or more directly engaging problems of form.<sup>165</sup> At the same time, Cooper was no formalist, and showed few authorial ambitions late in her career. It is possible that she might instead have cultivated the research environment she created, whose diversity of thought and rate of change might well have kept her occupied.

The pedagogical machine Cooper set in motion at MIT did not continue without her, however. After studying at MIT as both an undergraduate and a graduate student, and then starting a PhD at the Media Lab, John Maeda later returned to the Lab in 1996 “to fill the shoes of the late Muriel Cooper.”<sup>166</sup> But the discipline had also changed: “After 11 years,” Maeda notes, “the shoes still feel quite loose, as Muriel had spent decades going after many ‘grails’ of visual design.”<sup>167</sup> An endowed chair, the “Muriel R. Cooper Professor” exists today at the Lab,

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<sup>165</sup> The practice of designers, especially of a certain generation, turning to art-making can be seen in the late painting career of Elaine Lustig Cohen, or the more pronounced interest in collage-making, later in life, by Ivan Chermayeff. Michael Rock has hypothesized that “modern designers—[Paul] Rand, [Bruno] Munari, [Leo] Leoni—always seem to end their careers designing children’s books” as a way of returning to form as authorship. “The children’s book is the purest venue of the designer/author because the content is legible and the evocative potential of the form is unlimited.” Michael Rock, “Fuck Content” [2005] in *Multiple Signatures*, 93.

<sup>166</sup> Steven Heller, “Out of the Lab: An Interview with John Maeda,” *AIGA* website, January 8, 2008, <https://www.aiga.org/out-of-the-lab-an-interview-with-john-maeda>.

<sup>167</sup> *Ibid.*

but it is not for design.<sup>168</sup> Where a prospective design student might find an environment like the one Cooper created at MIT is unclear, but aspects of it are also now ubiquitous in design education and practice, and likewise the creative tools of amateurs. Adobe’s robust set of applications, formerly known as Creative Suite and now called Creative Cloud, includes graphics editing, desktop publishing, video editing, web development, and other interoperable tools. As Cooper understood, graphic designers would need to be conversant in multiple media, and many would design objects that would live only as “soft copy,” or the systems and platforms through which this content moved. Cooper might have enjoyed these tools, or been frustrated by their default status and their closed platform and corporate nature— part and parcel of their ability to keep graphics standards high while allowing unprecedented numbers of users and makers to participate. She might also have participated in the contemporary debate on the proper level of technical literacy among designers— or perhaps learned to code after all.<sup>169</sup>

Cooper might also have addressed herself to new problems, not taken up during her life, or manifesting more intensely after it. Her acknowledgement, in 1989, of “longer range, more fundamental research concerns having to do with the development of machines that will become ‘creative’ and autonomous,” and the problem of state or corporate incentives in their creation, is one such problem that has indeed intensified.<sup>170</sup> Where Cooper and her colleagues dreamed in the 1980s of a “personal newspaper,” compiled with machine intelligence, algorithms now shape our news diet while dubious information circulates on putatively “neutral” platforms whose business

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<sup>168</sup> The position is for “Music and Media,” and is held by Tod Machover, Director of the Opera of the Future Group, who has taught at the Media Lab since it officially opened in 1985. <https://www.media.mit.edu/people/tod>

<sup>169</sup> Alan Cooper (no relation) represents just one example of this conversation. See Alan Cooper, “Should Designers Code?,” Alan Cooper (blog), May 12, 2017, <https://medium.com/@MrAlanCooper/should-designers-code-f7b745b8cd03>.

<sup>170</sup> Cooper, “Computers and Design,” 30.

model depends on surveillance and enables censorship without accountability. This impossibly fast information economy is lent the even sheen of credibility by a consistent graphic language and the constantly improving natural language capacity of artificially intelligent bots.

The “engineering mentality” that Janet Murray identifies, that optimizes whatever it must, while it “defines the needs it cannot satisfy—and the suffering its solutions can inflict—as outside the domain of the problem,” is no less a part of the narrowly defined scope of “world-changing” in Silicon Valley culture.<sup>171</sup> Likewise, the techno-utopian dreams that Fred Turner traces in his book *From Counterculture to Cyberculture*, which imagined overcoming space and time while often neglecting the environmental, political, and human infrastructure that supports them, evolved on the same Bay Area soil into the apolitical and largely unaccountable technology culture of the present.<sup>172</sup> In the face of this, some designers’ continued interest in print today, and renewed interest in production, may have as much to do with nostalgia or craft as it does with a decentralized form of communication that is more immune from the reach of corporate or state control than electronic media— in other words, what countercultural print publications once excelled at. Alternatively, the possibility of the designer as a kind of interface, between the possibilities of technology and the needs of people, might respond to some of the insecurities Cooper sensed. In this case, design values might extend beyond questions of resolution and fidelity, immediacy and immersiveness, functionality and user-friendliness.

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<sup>171</sup> Murray, “Inventing the Medium,” 4.

<sup>172</sup> Turner’s history spans the 1960s to the 1990s, but, as his conclusion intimates, it holds great explanatory power for the present. See Fred Turner, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism* (Chicago: University of Chicago Press, 2006).

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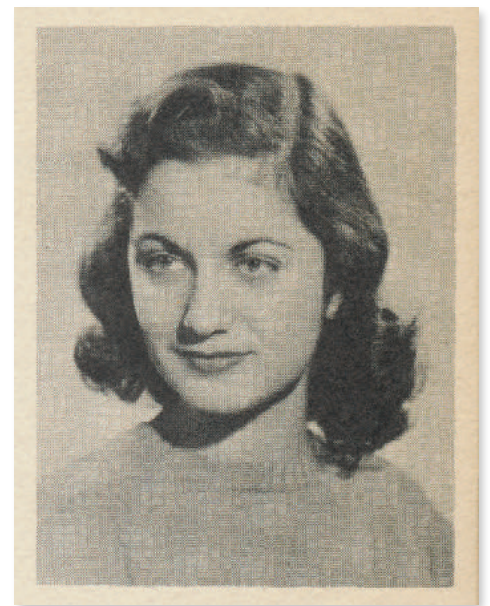
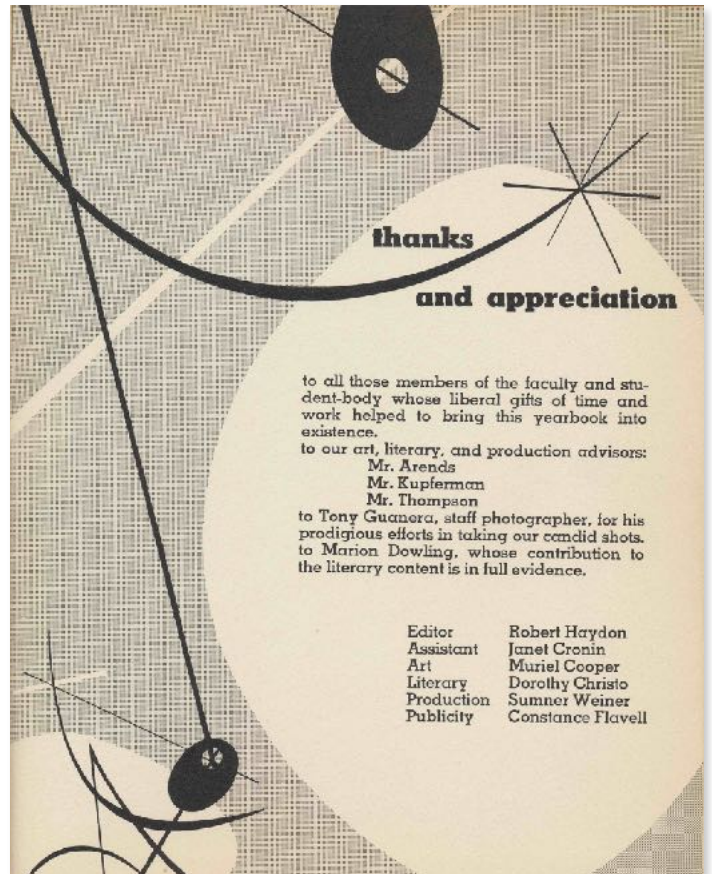
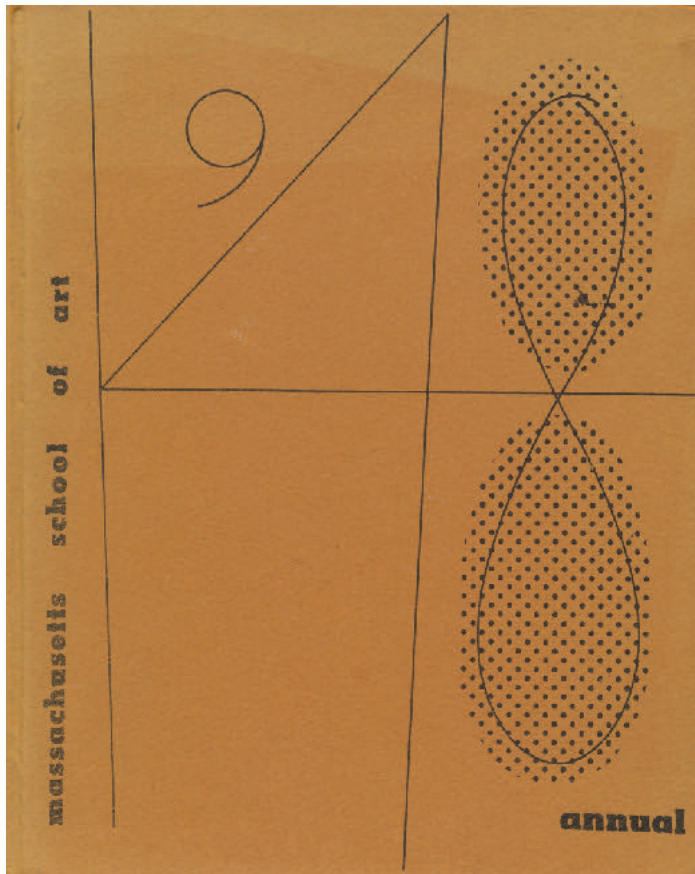
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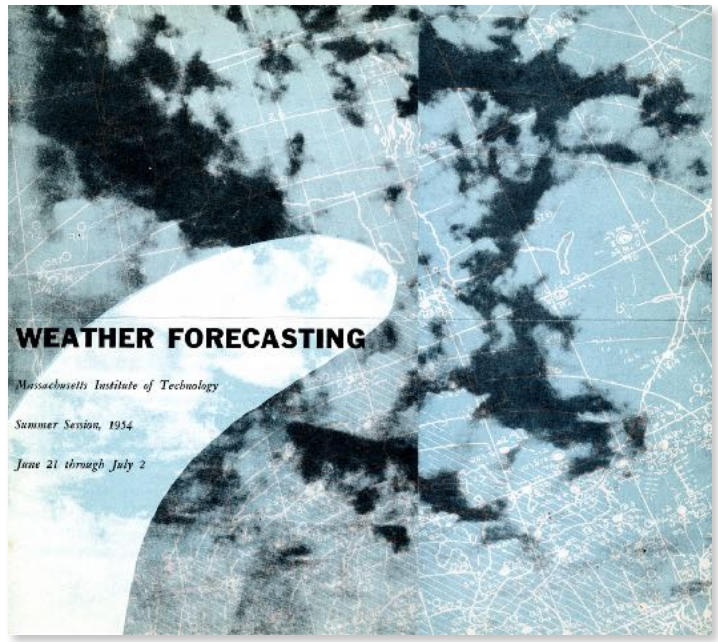
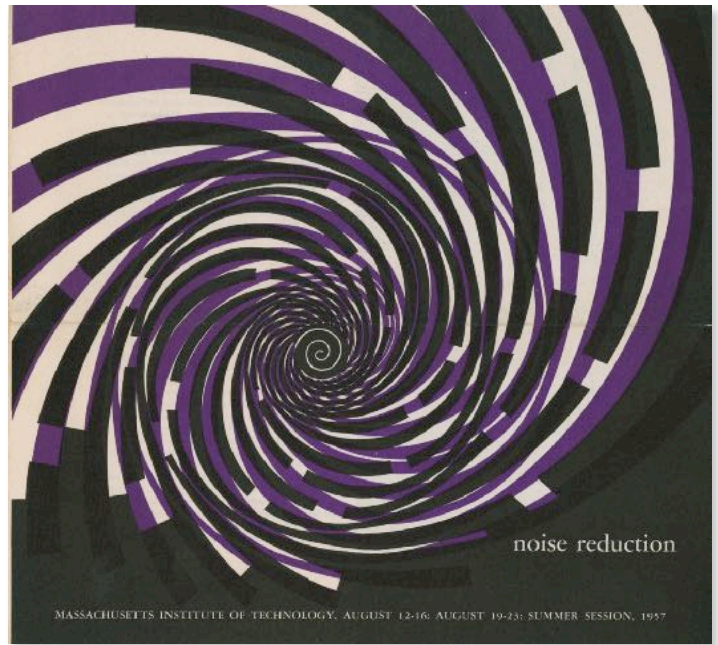
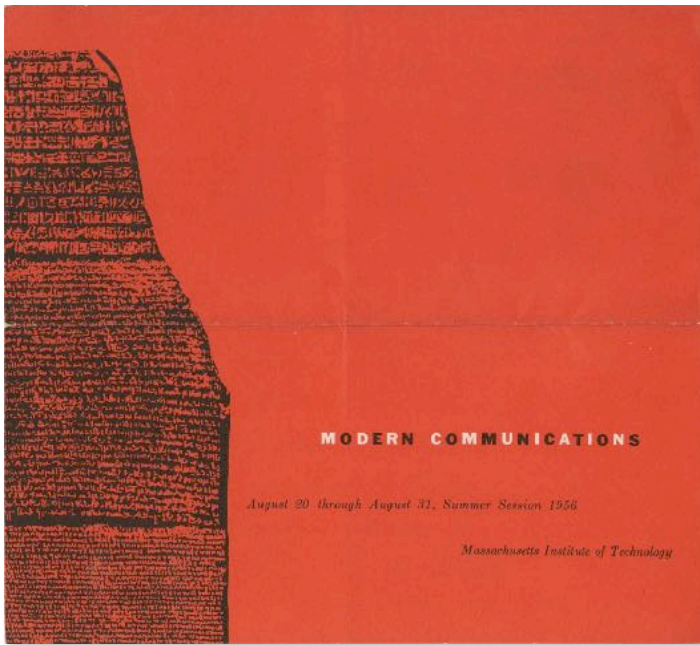
## Illustrations



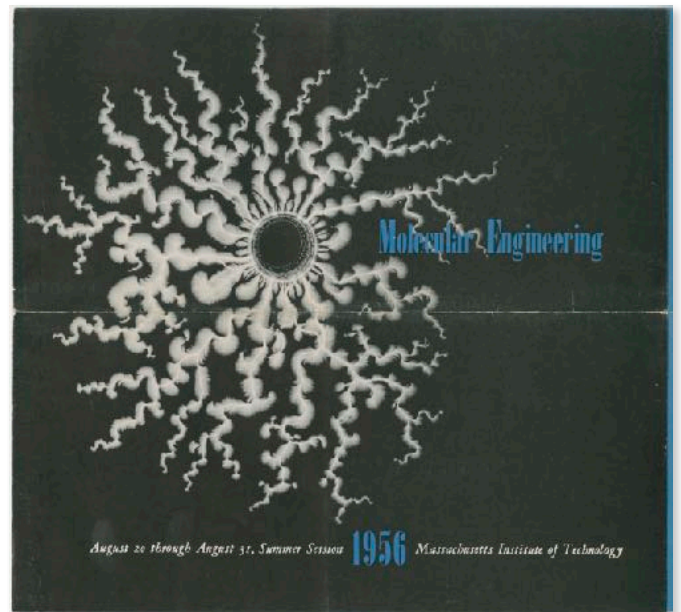
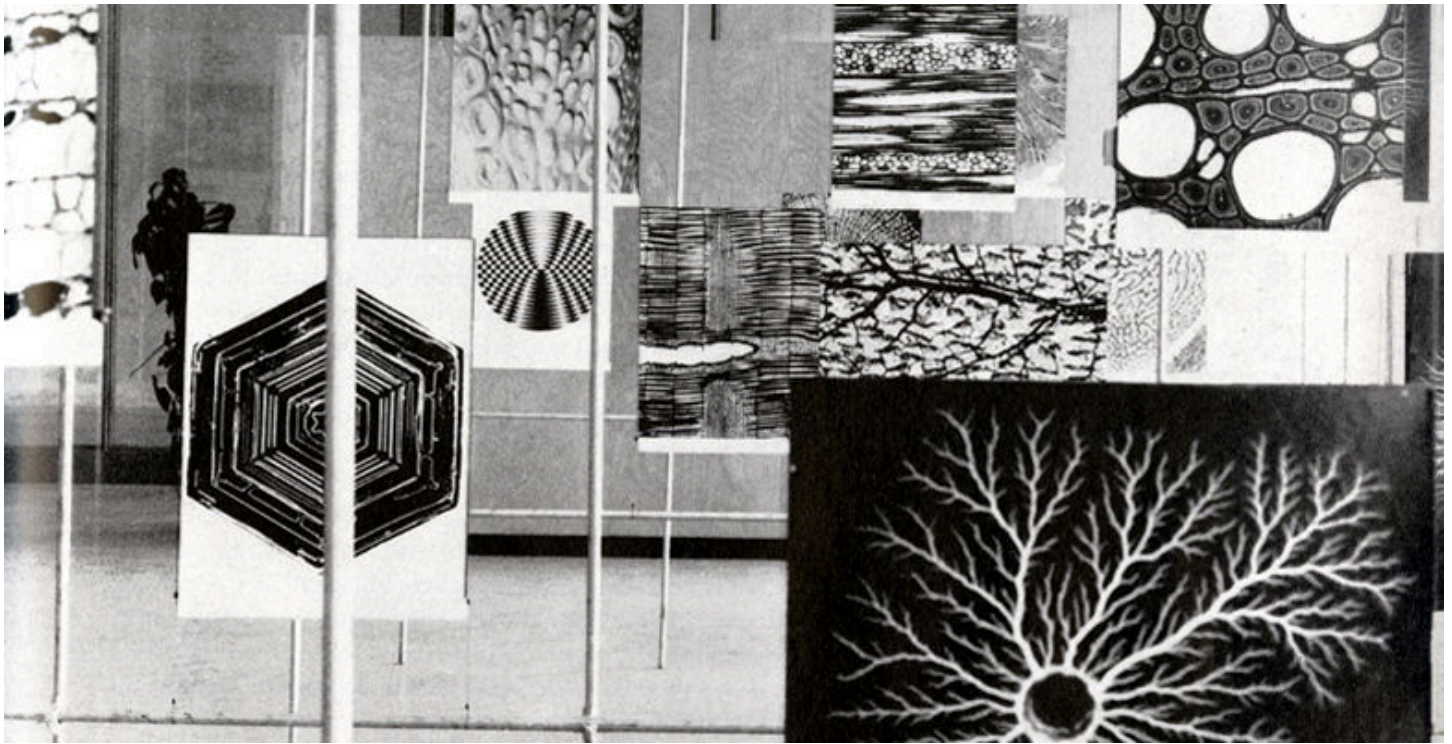
1.1 Muriel Cooper, *Massachusetts College of Art Annual*, 1948  
(cover, credits, class photo)



1.2. Muriel Cooper, MIT Office of Publications, Record album sleeves for “Music at MIT” series, 1950s



1.3. Muriel Cooper, MIT Office of Publications, Fliers for summer session courses, c. 1954–7



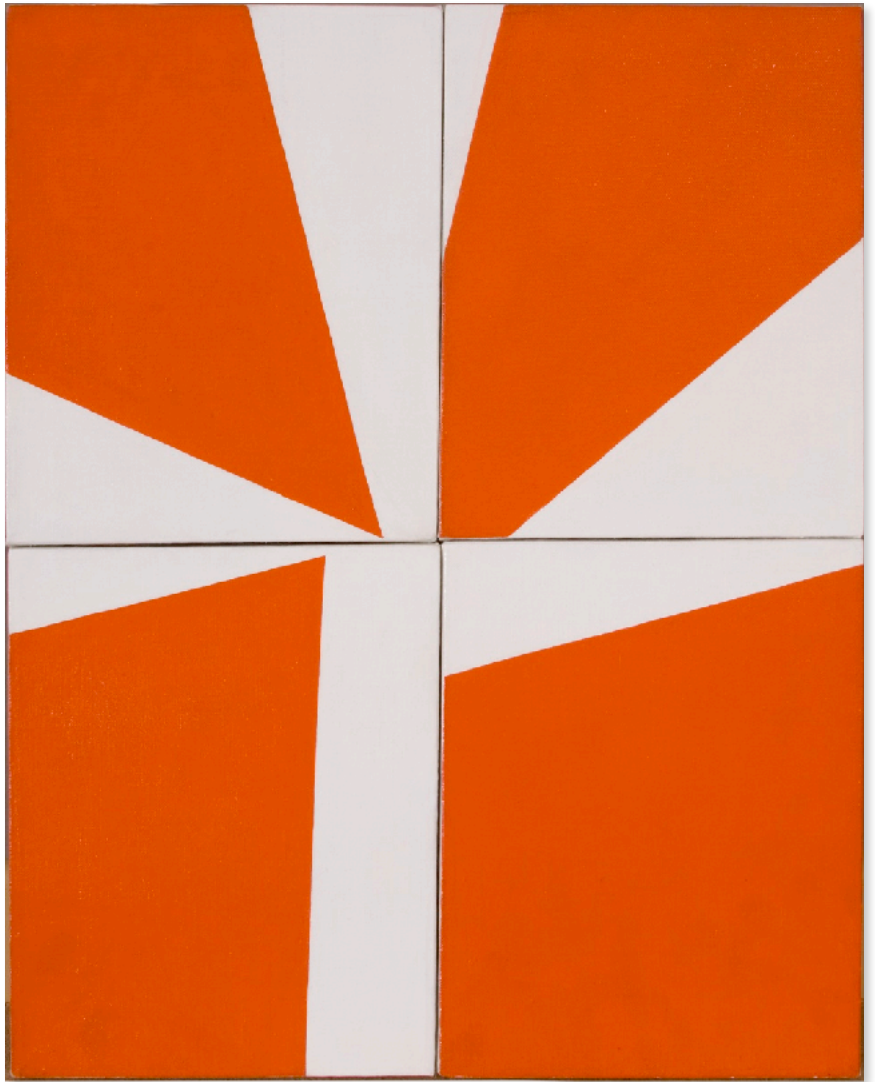
1.4. Gyorgy Kepes, *The New Landscape*, MIT Hayden Gallery, 1951  
Muriel Cooper, Office of Publications, summer session flier, 1956



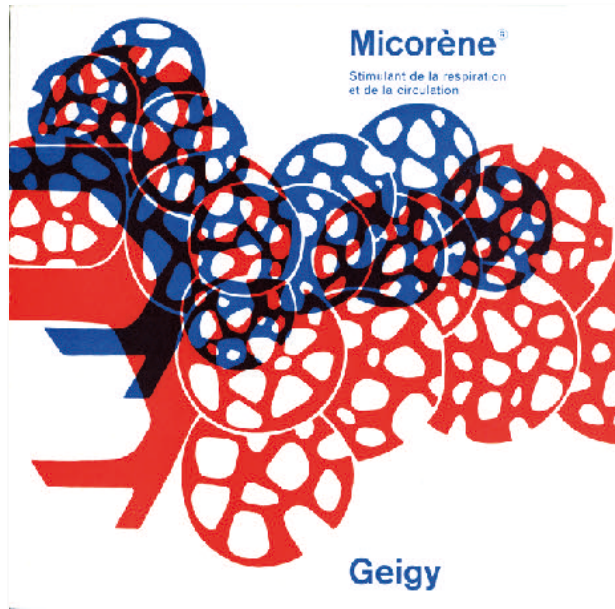


1.6. Muriel Cooper, Photographs from Milan, 1957

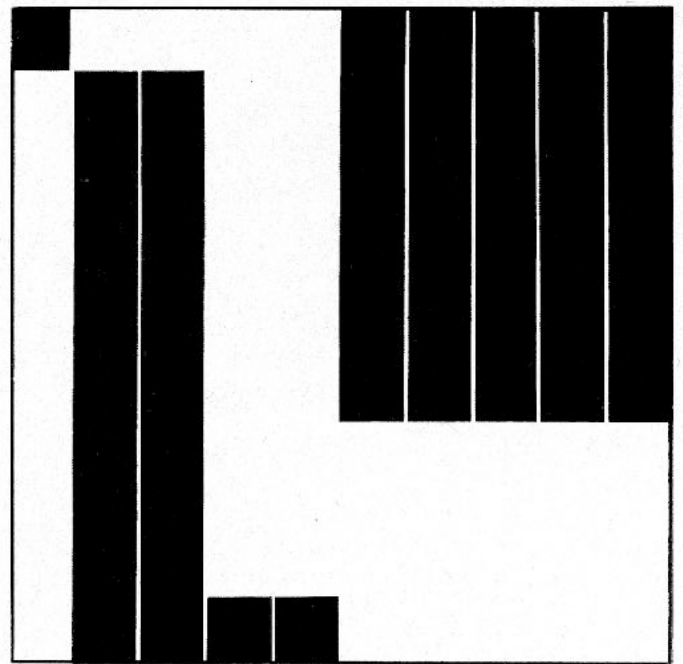
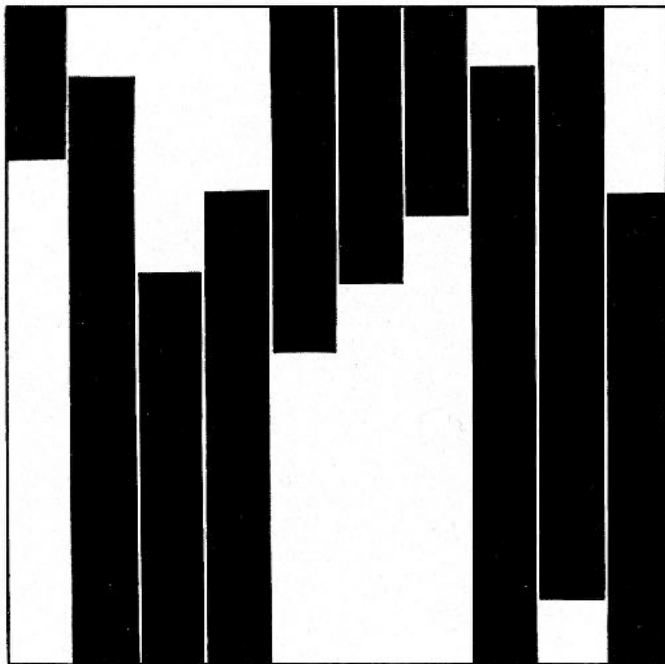




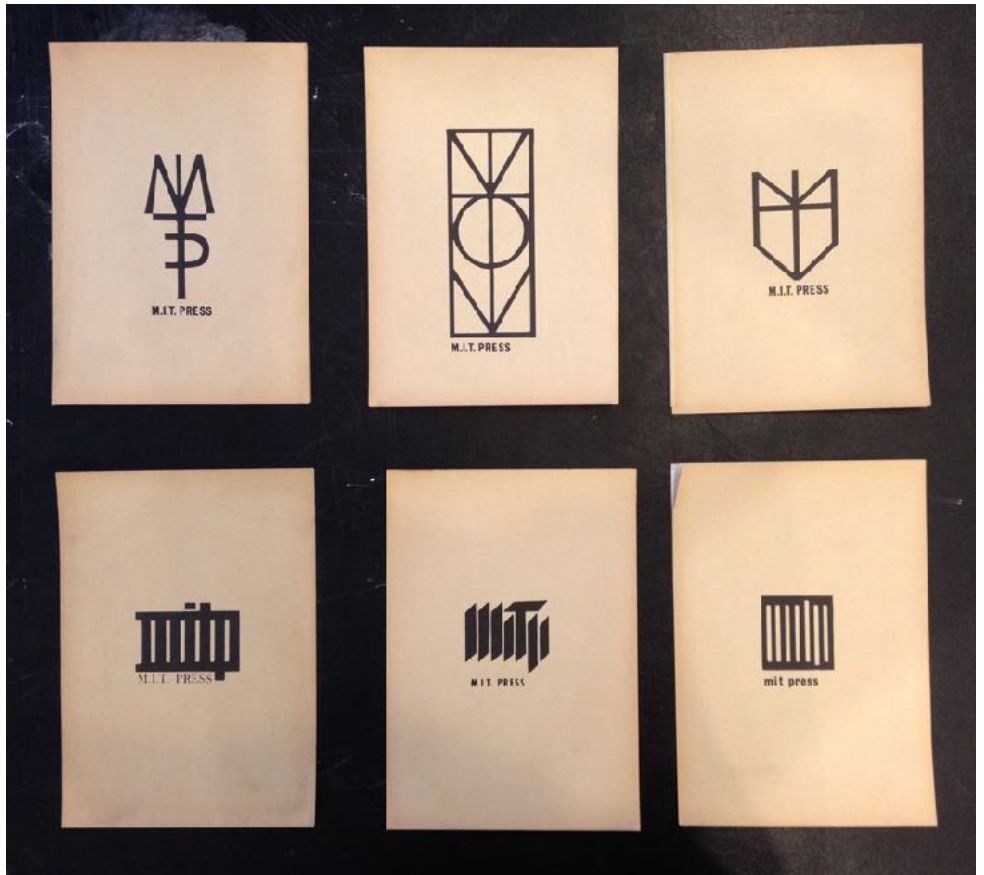
1.7 Ralph Coburn, *Cross*, oil on canvas panels, 1949–50  
MIT Office of Publications, summer session flier, 1958



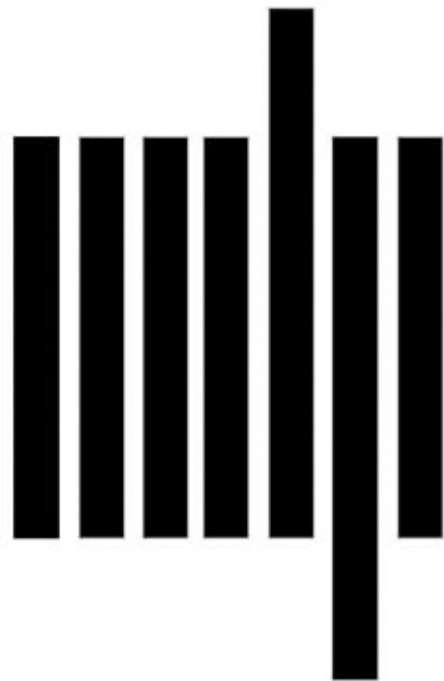
1.8. Theres Moll, Advertisement for Geigy AG, 1957  
MIT Office of Publications, summer session flier, 1959



1.9. Theres Moll, Selected exercises for Armin Hofmann's course at the Allgemeine Gewerbeschule, Basel, 1950-51  
Published in Hofmann's *Graphic Design Manual: Principles and Practice*, 1965



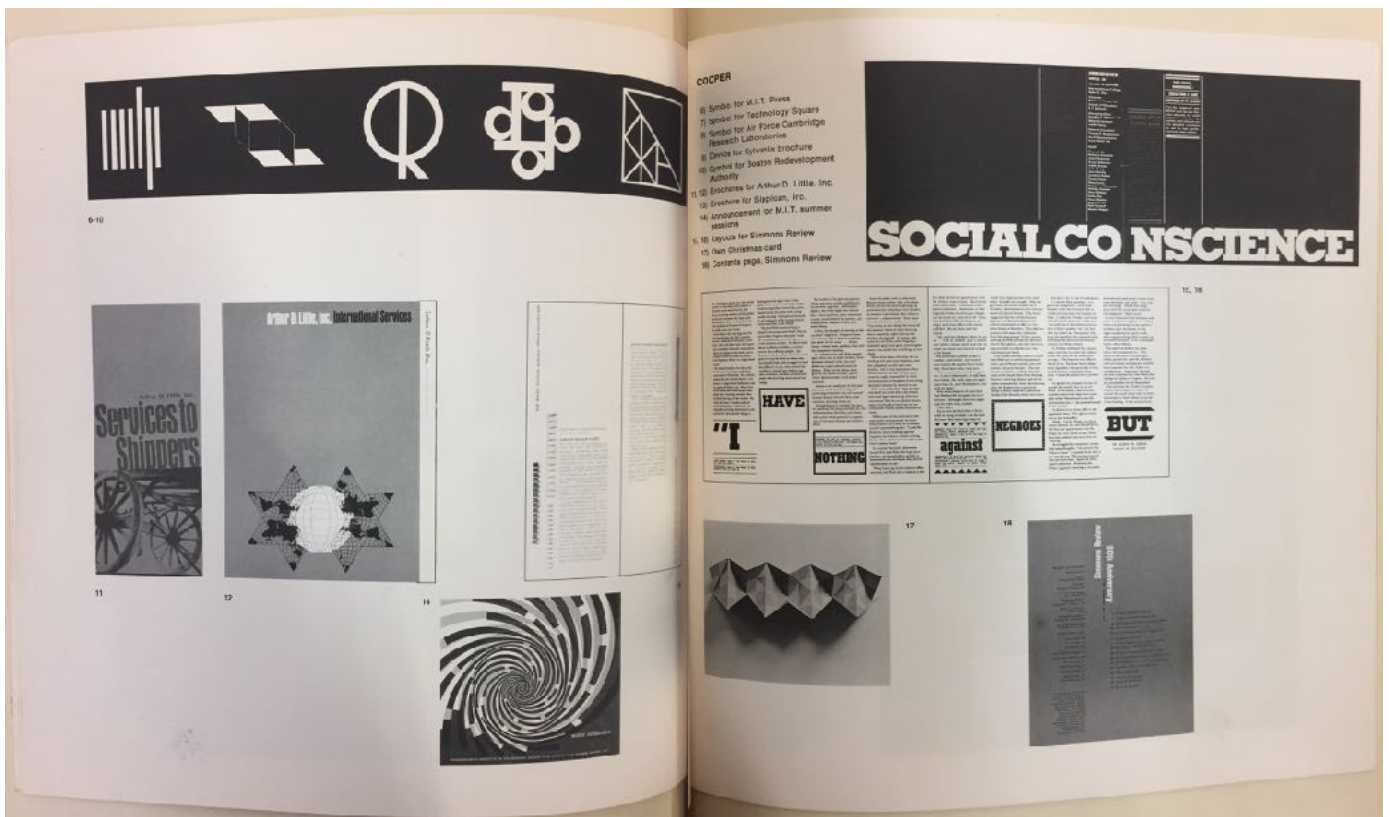
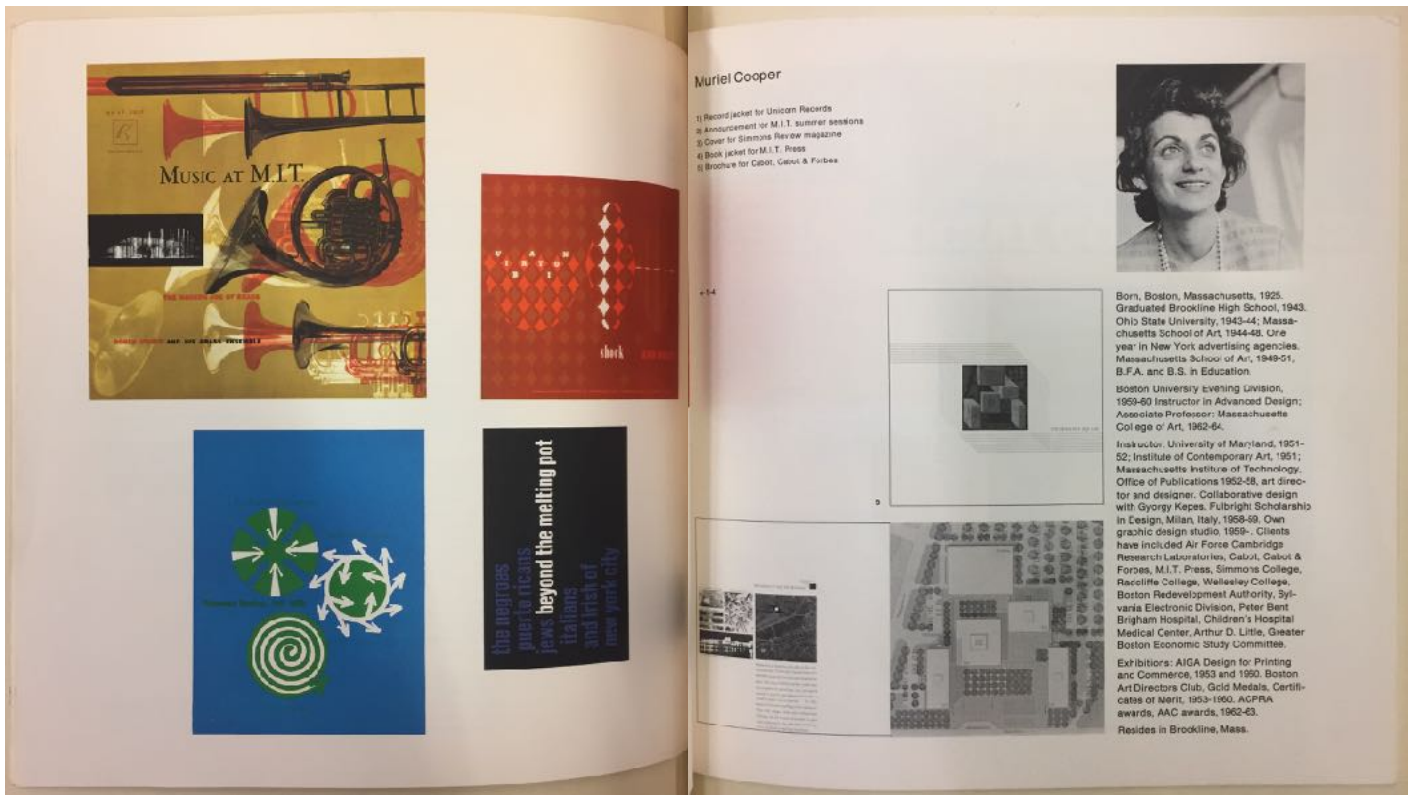
1.10. Muriel Cooper, Presentation boards, MIT Press Colophon, c. 1962



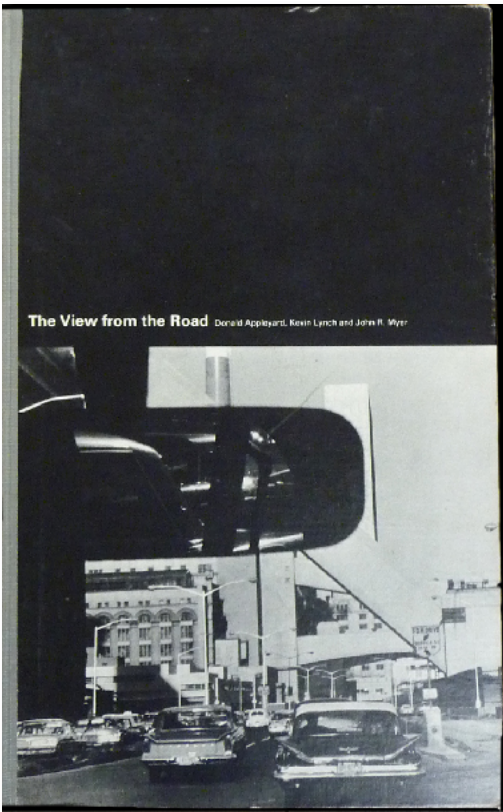
1.11. Muriel Cooper, Final MIT Press Colophon, 1963



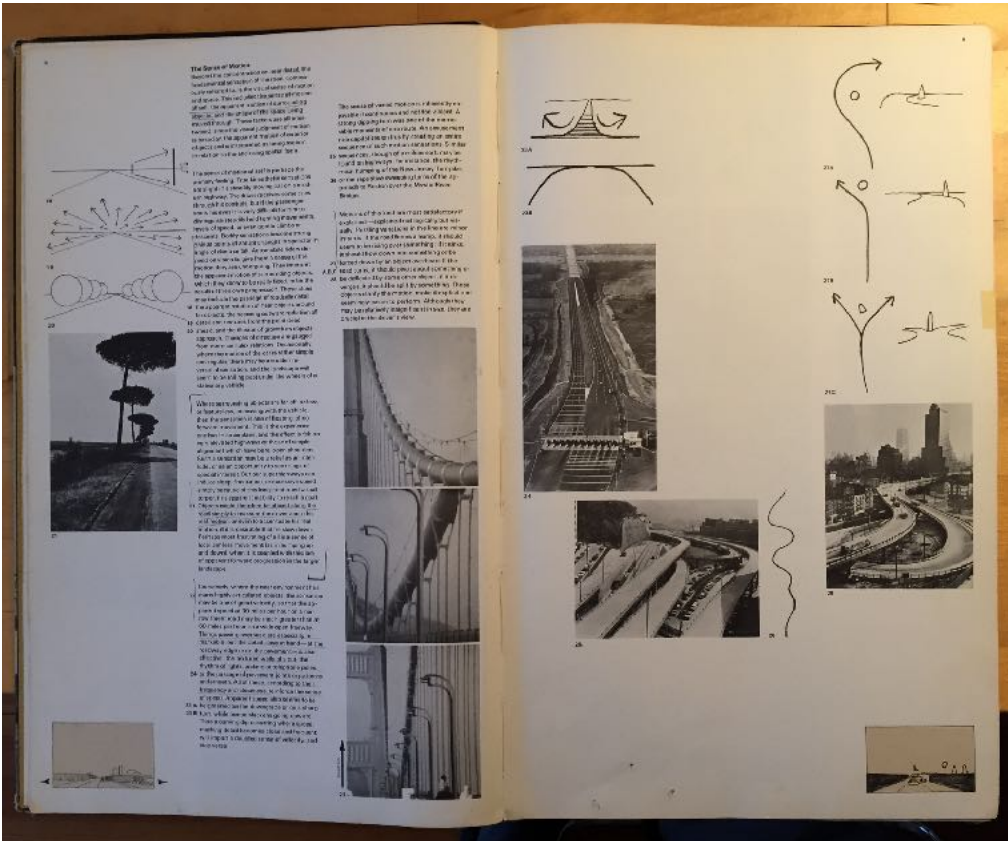
1.12 Muriel Cooper, Cover for *Communication by Design* publication, Addison Gallery, 1964



1.13 Work by Cooper in *Communication by Design* publication, Addison Gallery, 1964



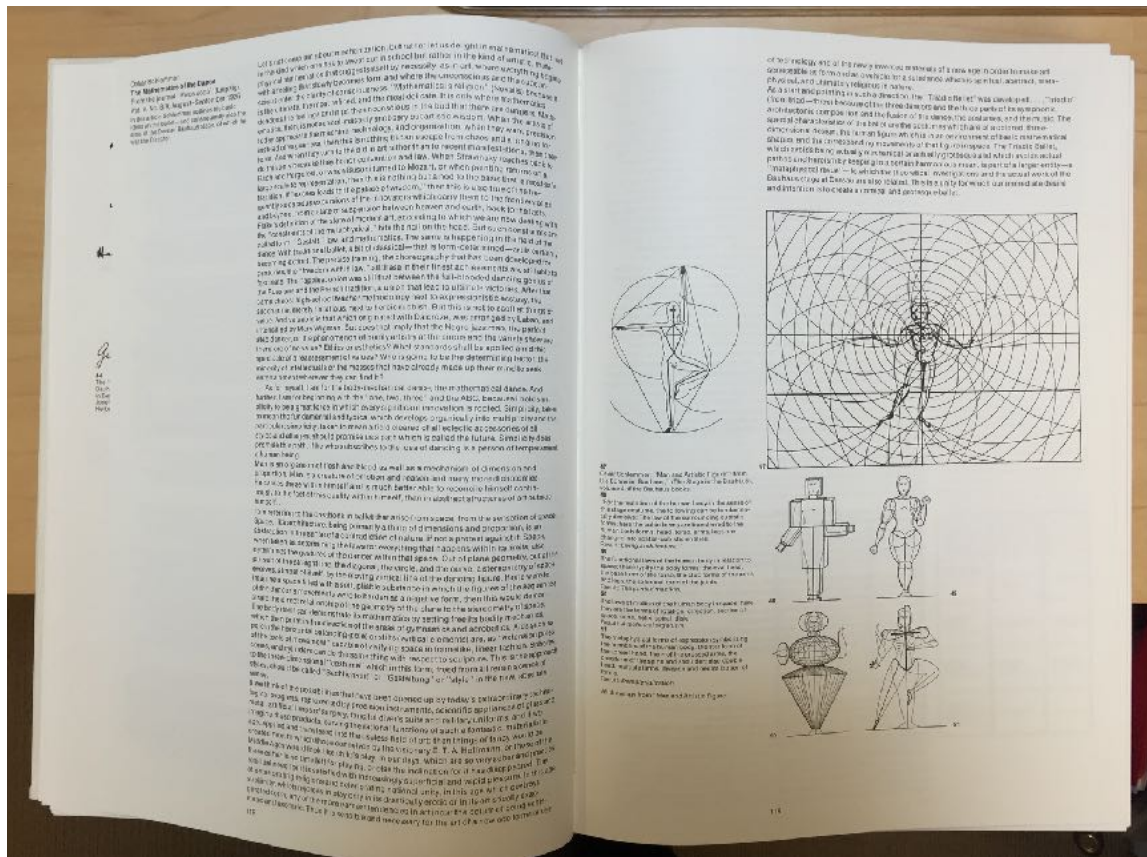
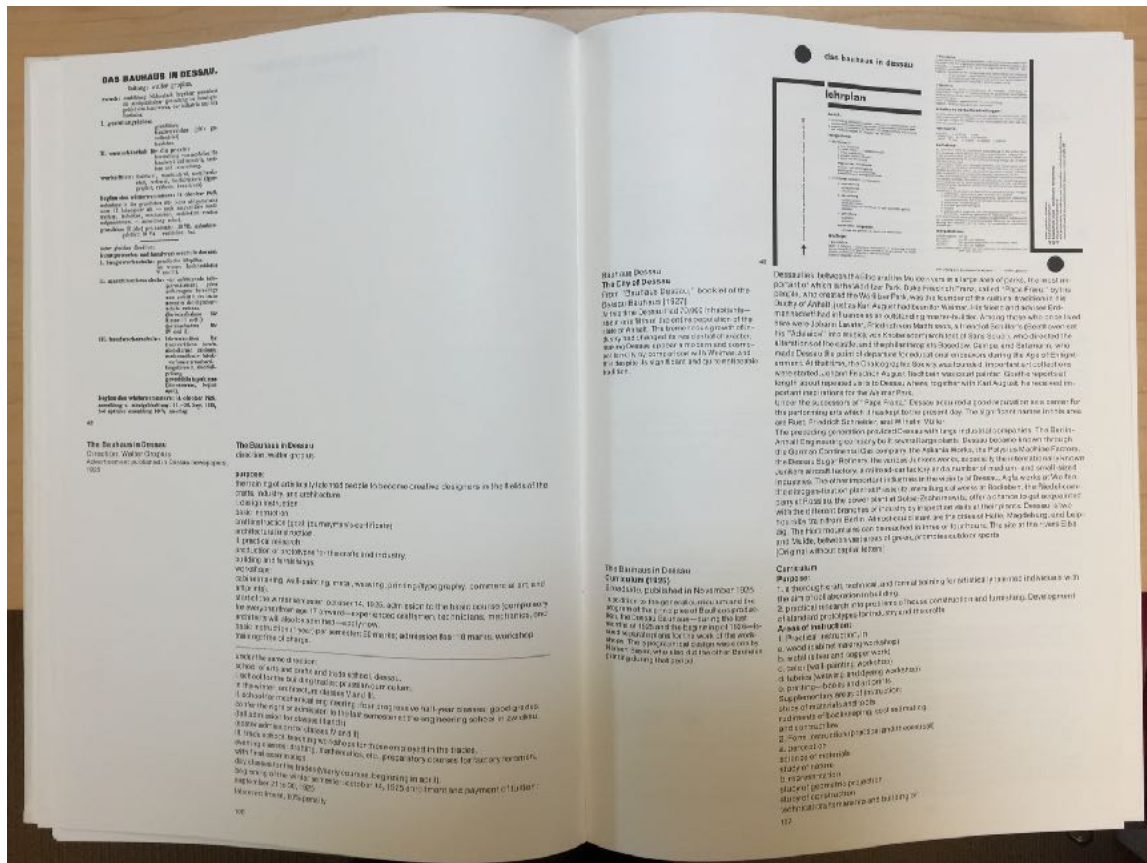
To Gyorgy -  
 You are behind  
 this, as usual!  
 Kevin



1.14. Donald Appleyard, Kevin Lynch, John Meyer, *The View from the Road*, MIT Press, 1964 (cover, spread, and inscription, from Kevin Lynch to Gyorgy Kepes)

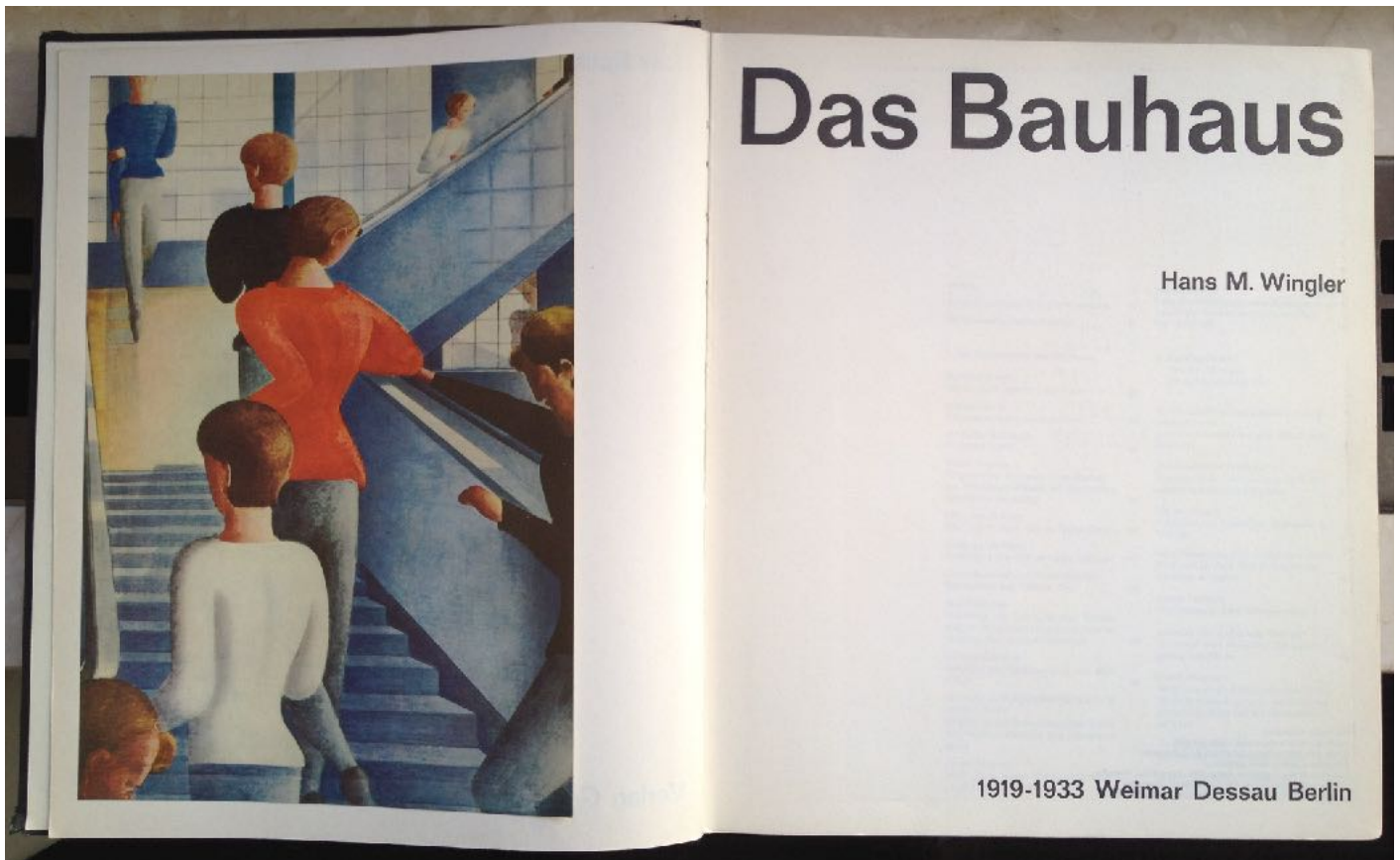


2.1 Hans Wingler, ed., *The Bauhaus: Weimar, Dessau, Berlin, Chicago*, MIT Press, 1969 (cover and slipcover)

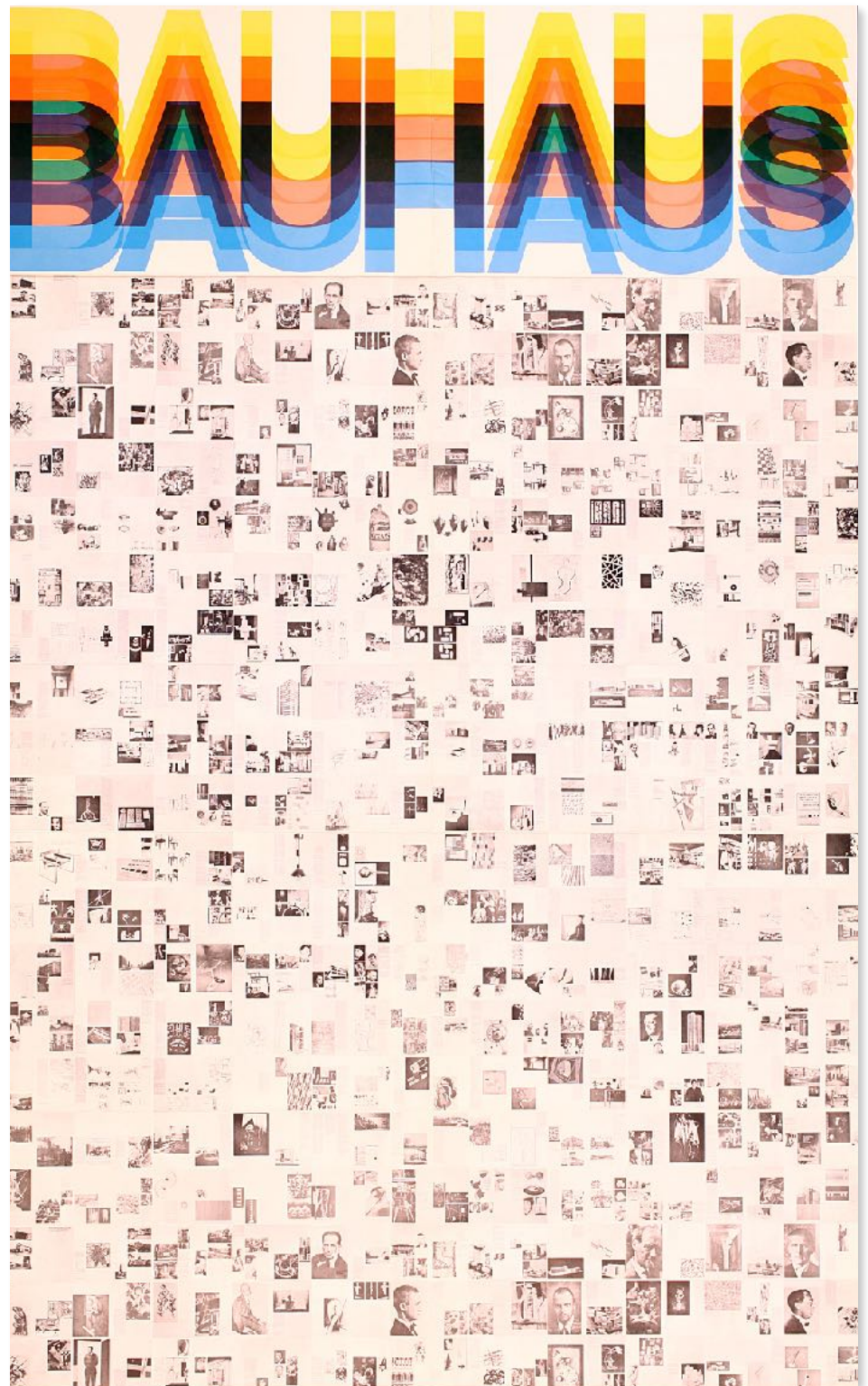


2.1 cont'd Hans Wingler, ed., *The Bauhaus: Weimar, Dessau, Berlin, Chicago*, MIT Press, 1969 (spreads)



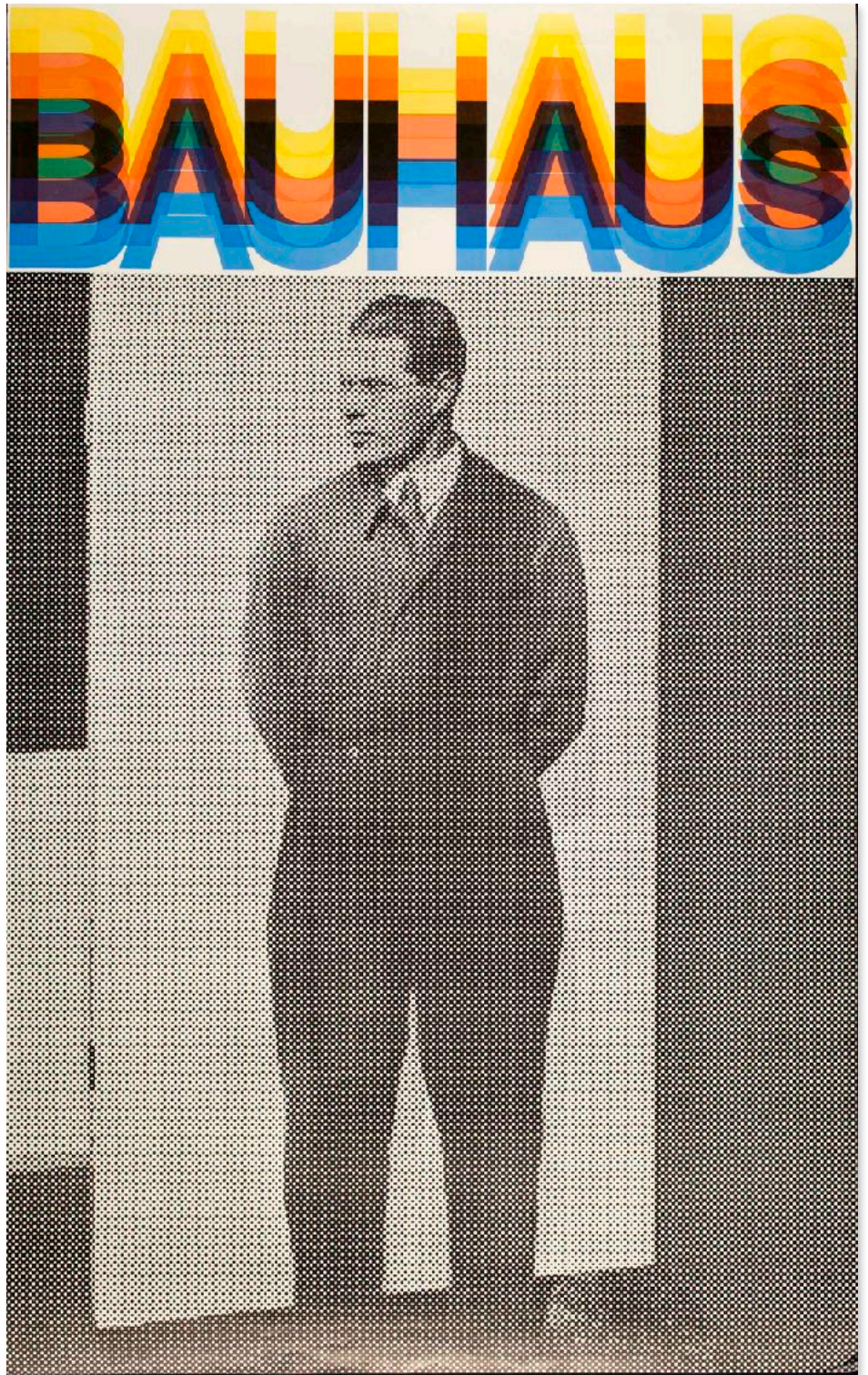


2.2 Hans Wingler, ed., *Das Bauhaus, 1919–1933: Weimar, Dessau, Berlin*, Bramsche, 1962 (spreads)

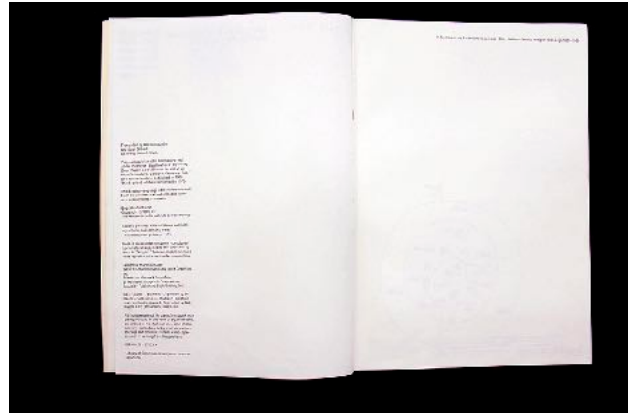
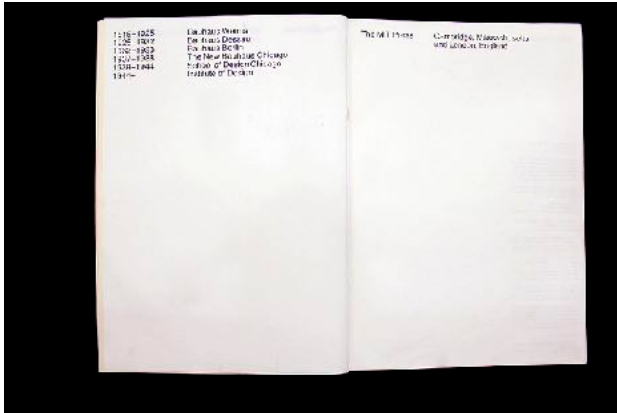
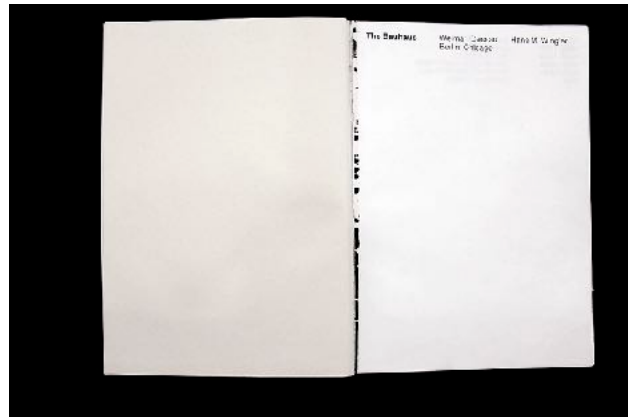


2.3 Muriel Cooper and MIT Press Design Department,  
Announcement for *The Bauhaus*, 1969

2.4 Muriel Cooper and MIT Press Design Department,  
Poster promoting *The Bauhaus*, 1969



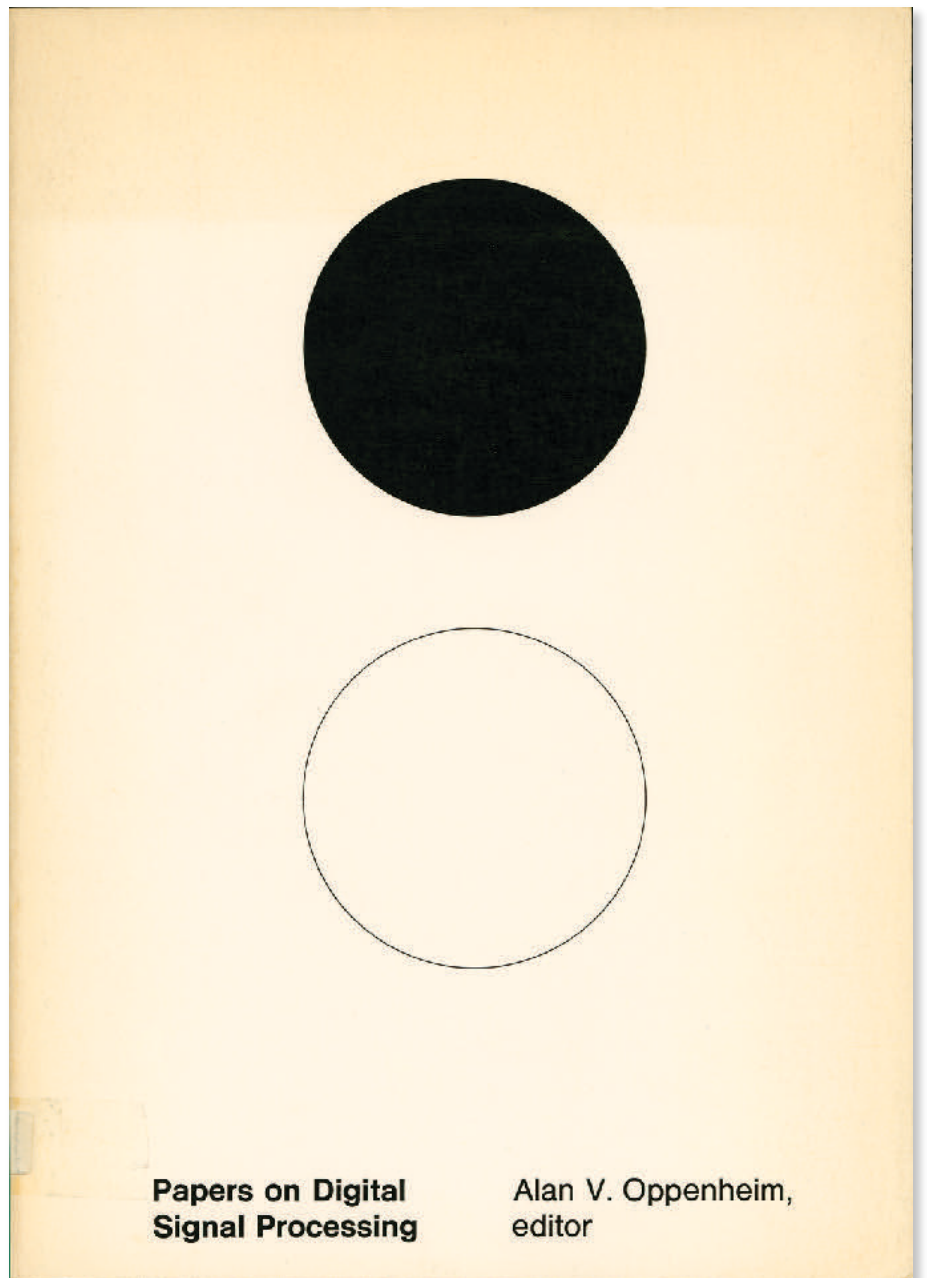
2.5 Muriel Cooper and MIT Press Design Department,  
Poster promoting *The Bauhaus*, 1969



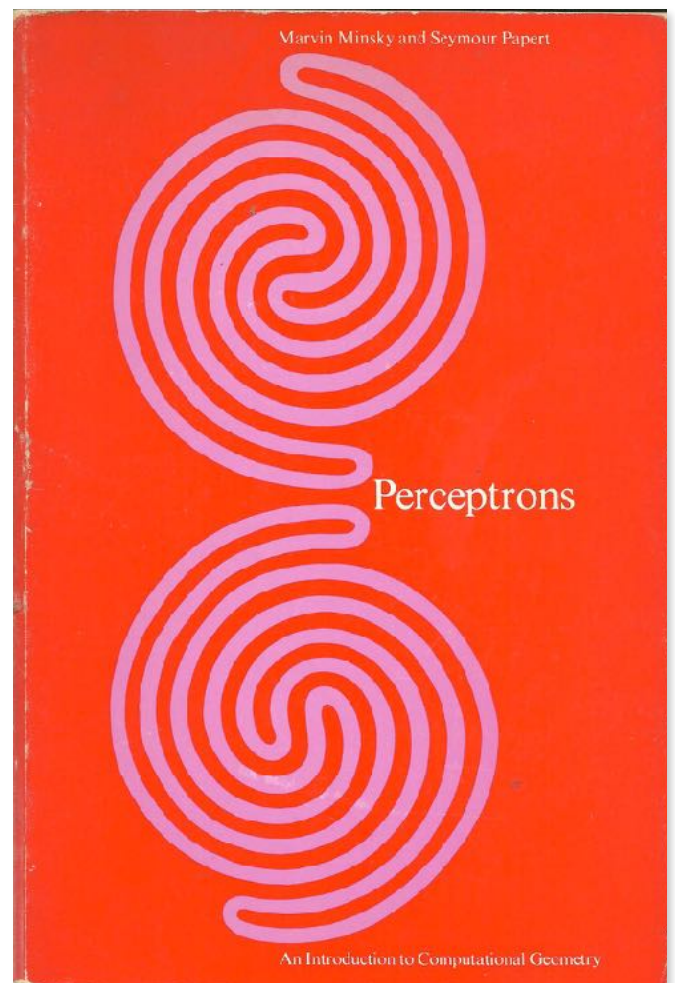
2.6 Video recreation of the *The Bauhaus* film, c. 1974/2014 (stills)



2.7 Manuscript of *The Bauhaus* as shown in *Book 2,000* exhibition, Compton Gallery, MIT, 1979



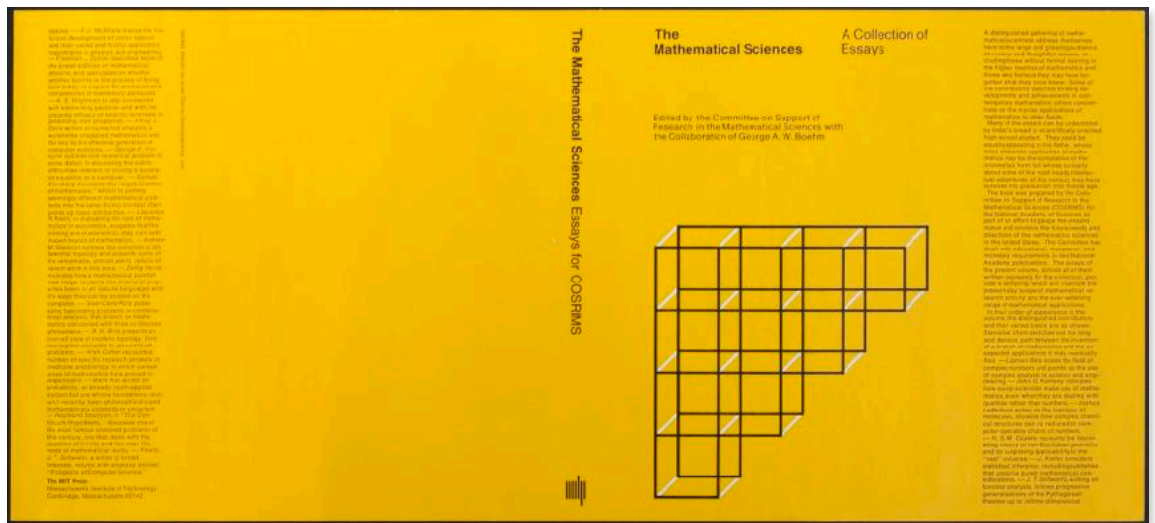
2.8 Alan Oppenheim, ed. *Papers on Digital Signal Processing*, MIT Press, 1969 (cover)



2.9 Nicholas Negroponte, *The Architecture Machine*, MIT Press, 1970 (cover)

2.10 Marvin Minsky and Seymour Papert, *Perceptrons: An Introduction to Computational Geometry*, 1969 (cover)

| Author                  | Editor | Year | Month    | Day | Volume | Issue | Page | Price | ISBN | Notes   |
|-------------------------|--------|------|----------|-----|--------|-------|------|-------|------|---|
| Andersen<br>#109PM      | PS     | 197  | 9-29-72  |     |        |       |      |       |      | PL Pre-Intro<br>L Launch date<br>EN Ed. M. 1972<br>EI Editorial W<br>EO Editorial 1972<br>SO Special Chgs<br>SI Samples Int<br>RC Release Cont<br>CS Release Suppl<br>CP Contents Chgs<br>IT Info Comp<br>HC In the Comp<br>TC Typogr. Comp<br>E Encls. Comp<br>EB Ed. Bk. Bk.<br>AD Advance Ubr.<br>DM Dedicatory<br>OC Office Copie<br>MK Abstracts Chgs<br>MS Abstracts Chgs |
| Levy<br>#RPM1PR         | SB     | 155  | 5-18-72  |     |        |       |      |       |      |   |
| Sutton<br>#RPM          | PS     | 225  | 12-11-72 |     |        |       |      |       |      |   |
| Goldman<br>#RPM         | PS     | 223  | 12-13-72 |     |        |       |      |       |      |   |
| Raywell<br>#RPM         | PS     | 133  | 8-11-72  |     |        |       |      |       |      |   |
| Harshbarger<br>#RPM     | PS     | 1    | 1-3-73   |     |        |       |      |       |      |   |
| Levy<br>#RPM            | PS     | 1    | 12-12-72 |     |        |       |      |       |      |   |
| Fleiss and Mack<br>#RPM | PS     | 6    | 4-14-70  |     |        |       |      |       |      |   |
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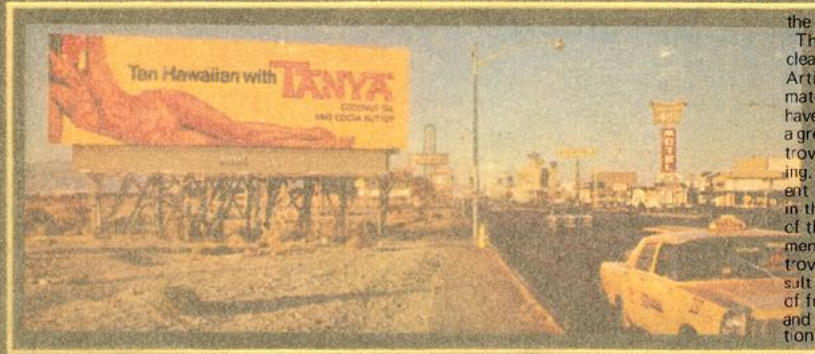


2.11 MIT Press tracking sheet, 1970s

2.12 Selected MIT Press book covers, (from top) 1969 (by Allan Davis/Omnigraphics) and 1970

# A Significance for A&P Parking Lots, or **Learning from Las Vegas**. Commercial Values and Commercial Methods. Billboards Are Almost All

Here is a plea for a proper architectural humanity and humility as well as a plan to accommodate the desires and values of ordinary people, who are too often dragged along on architectural ego trips and uplift programs. It is also a realistic examination of the American vernacular environment as it is and a reexamination of the goal of

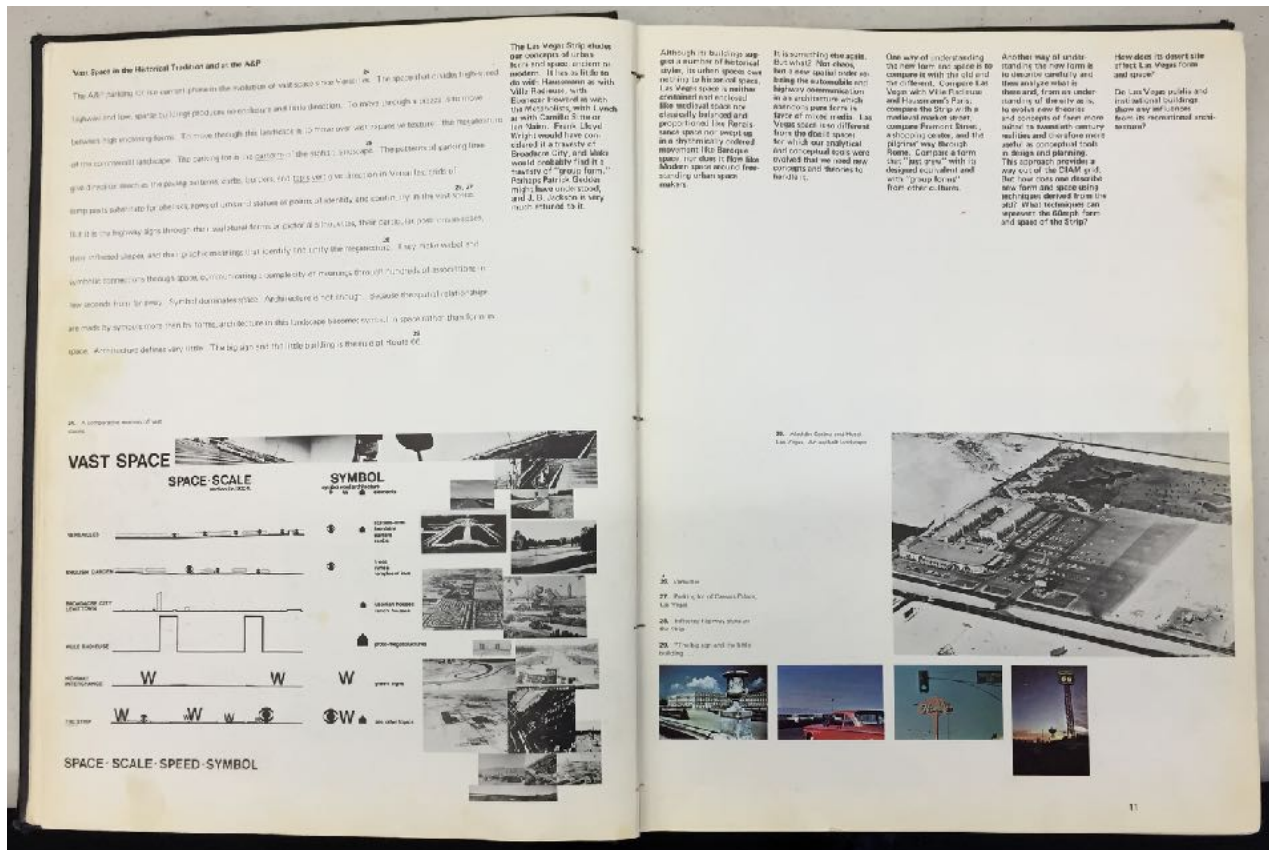
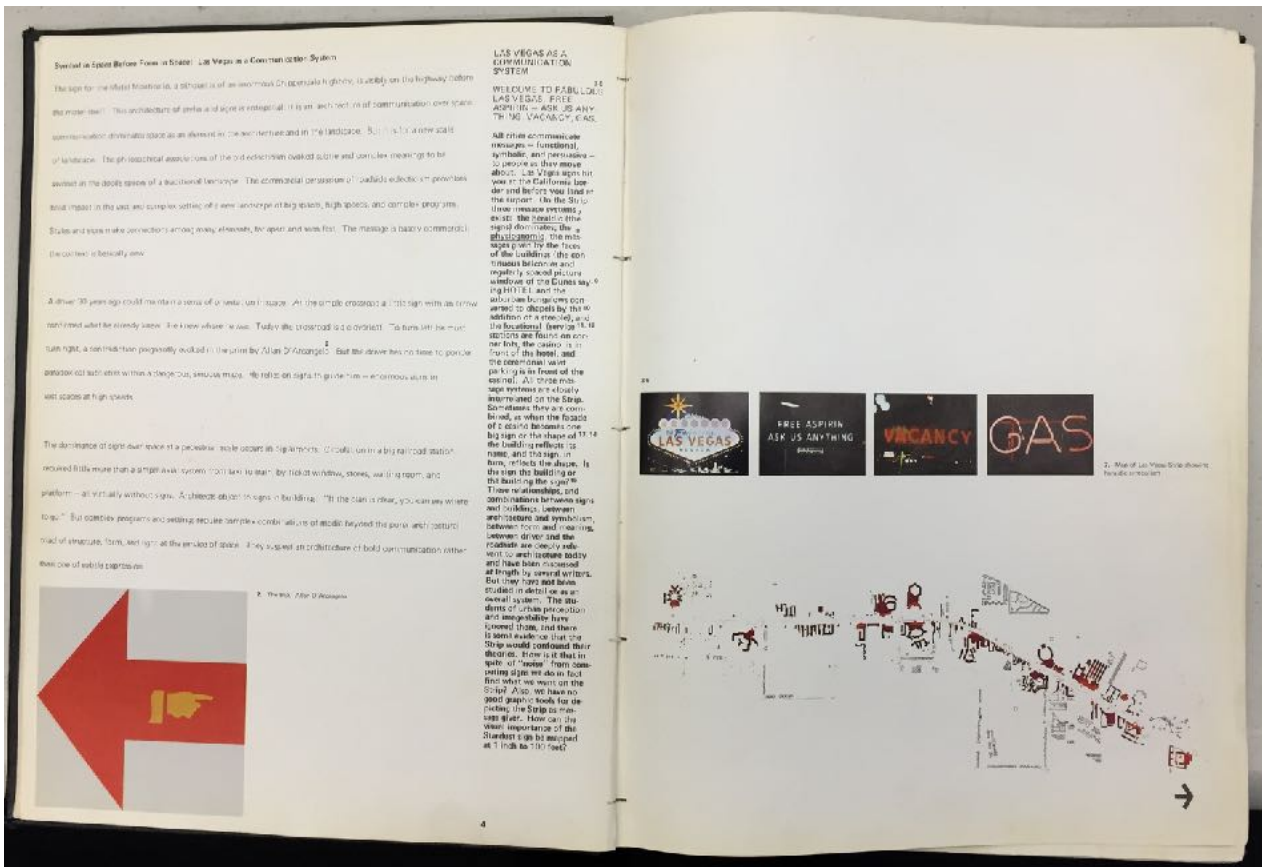


the architect. The challenge is clear and forthright. Articles based on material in this book have already caused a great deal of controversy and rethinking. But at the present uncertain point in the development of the Modern movement, it's a useful controversy that could result in a firmer sense of future direction and closer accommodation to social realities.

Right. Architecture as Space. Architecture as Symbol. Symbol in Space before Form in Space: Las Vegas as a Communication System. The Architecture of Persuasion. Vast Space in the Historical Tradition and at the A&P. From Rome to Las Vegas. Maps of Las Vegas: Las Vegas as a Pattern of Activities. Main Street and the Strip. System and Order on the Strip, and "Twin Phenomena."  
Robert Venturi Denise Scott Brown Steven Izenour  
Change and Permanence on the

2.13 Robert Venturi, Denise Scott Brown, Steven Izenour, *Learning from Las Vegas*, MIT Press, 1972 (cover with glassine dustjacket)

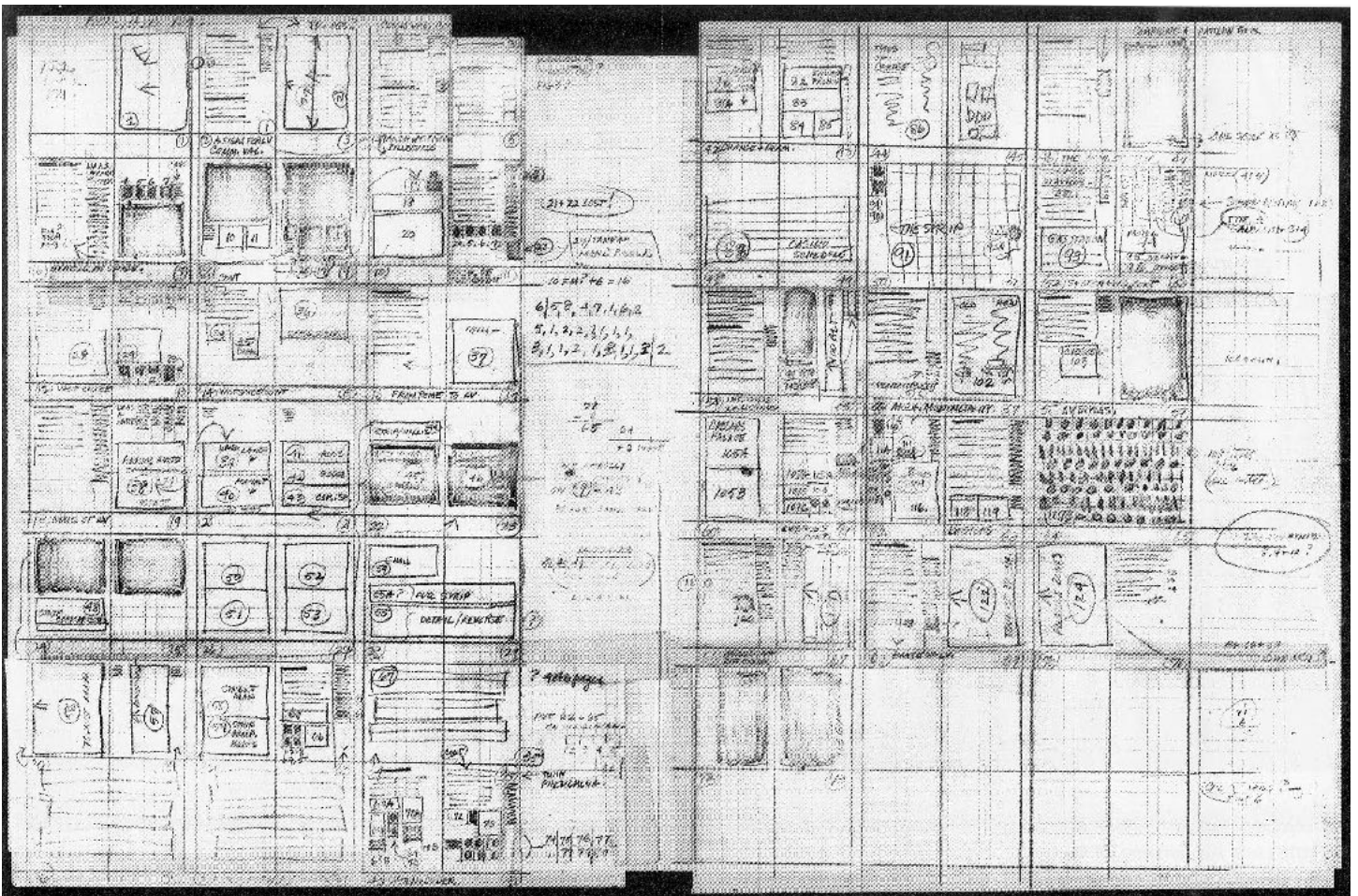




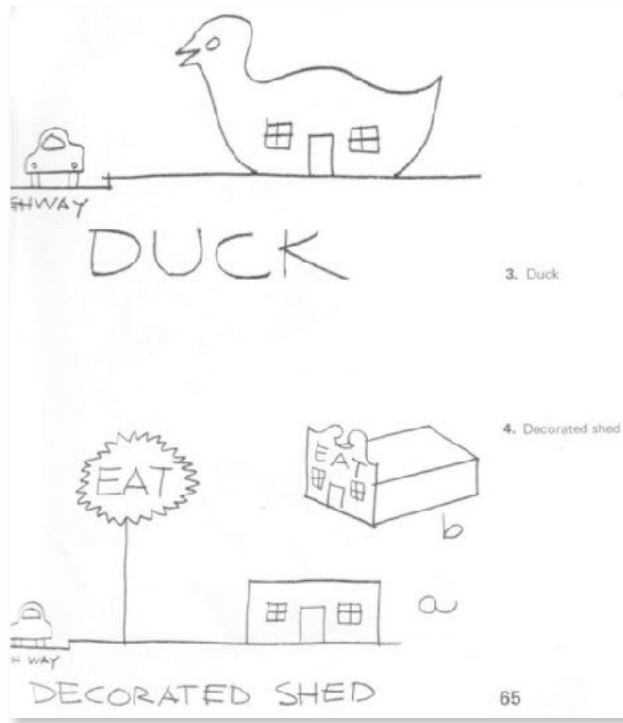
2.13 cont'd Robert Venturi, Denise Scott Brown, Steven Izenour, *Learning from Las Vegas*, MIT Press, 1972 (spreads)



2.14 Photographs from the Las Vegas Studio, Yale School of Architecture, 1968

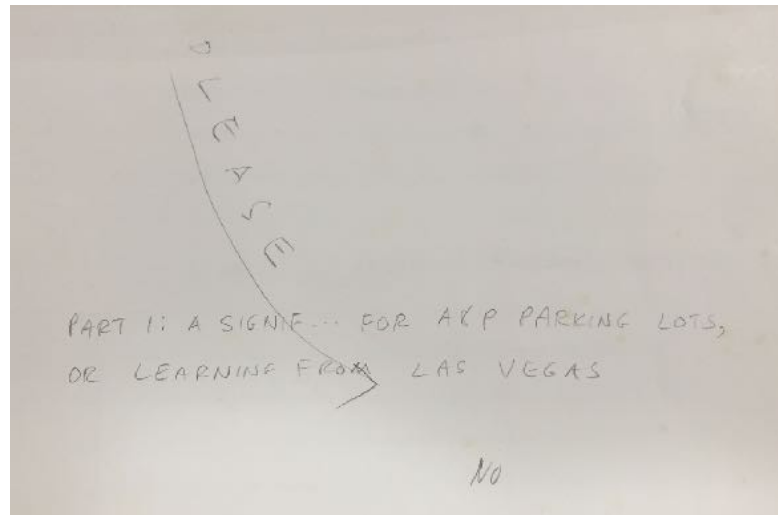
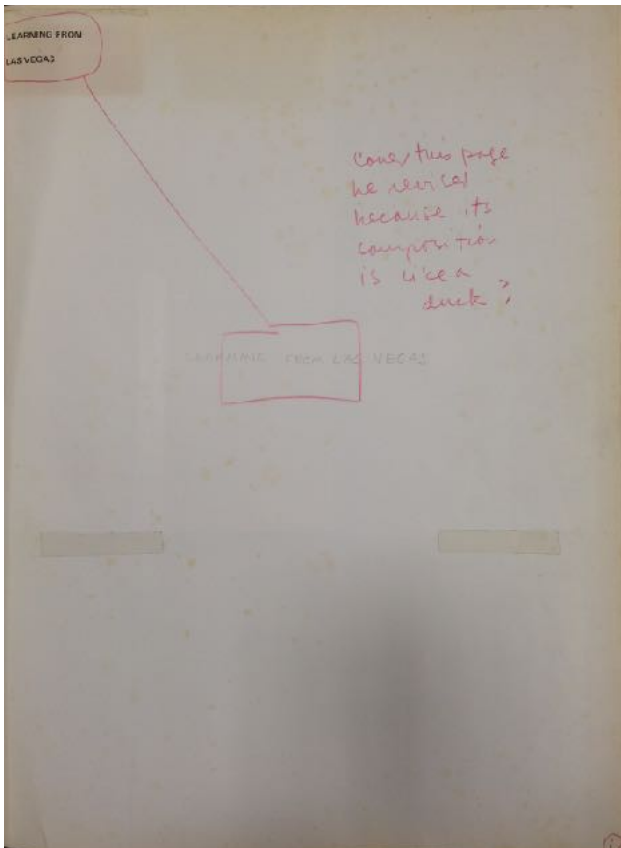


2.15 Muriel Cooper, Thumbnail layouts for *Learning from Las Vegas*, 1971

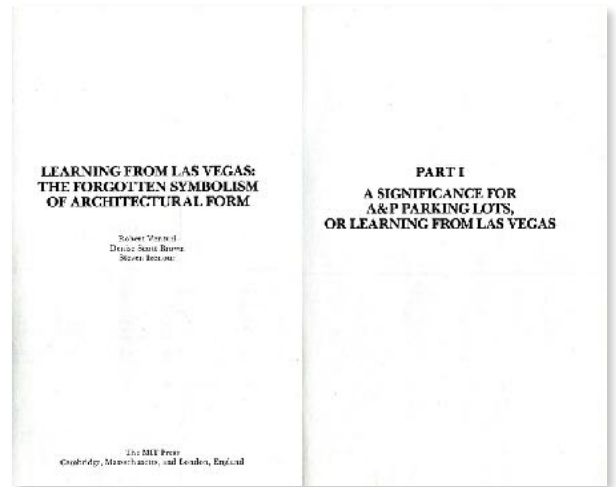
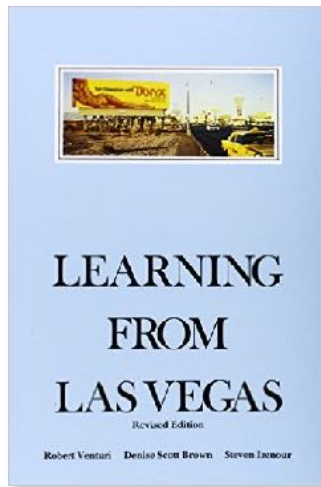


2.16 Duck vs. Decorated Shed from *Learning from Las Vegas*, 1972

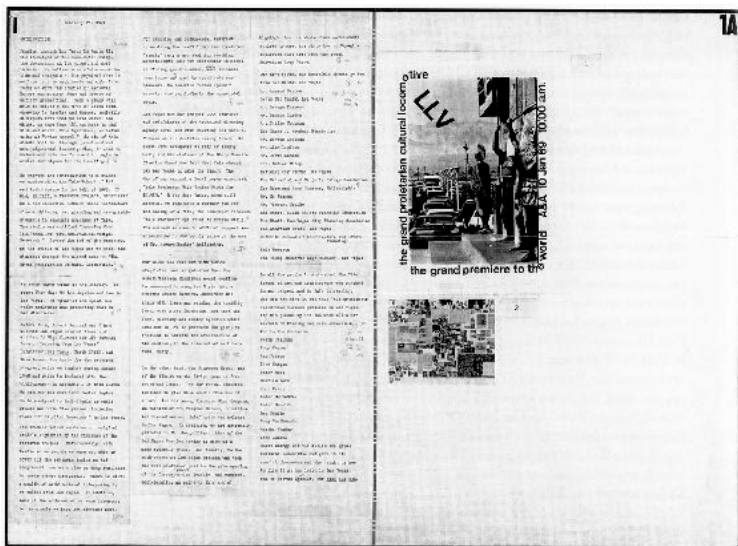
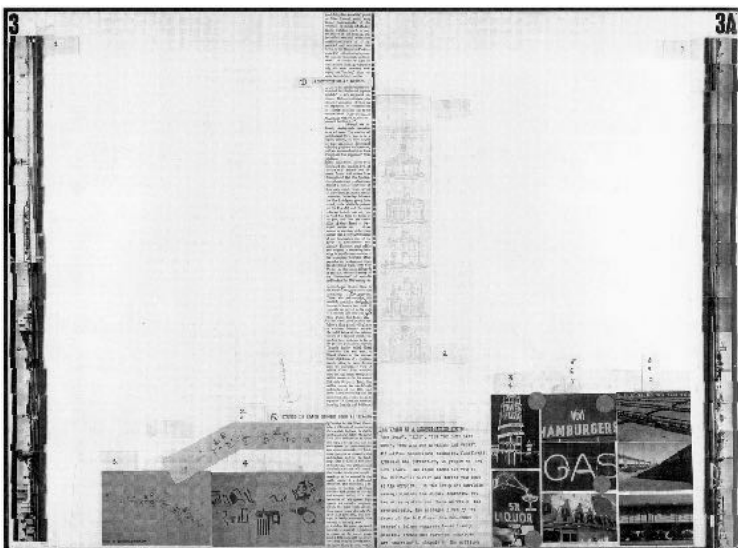
2.17 Le Corbusier, *Vers une Architecture*, 1923



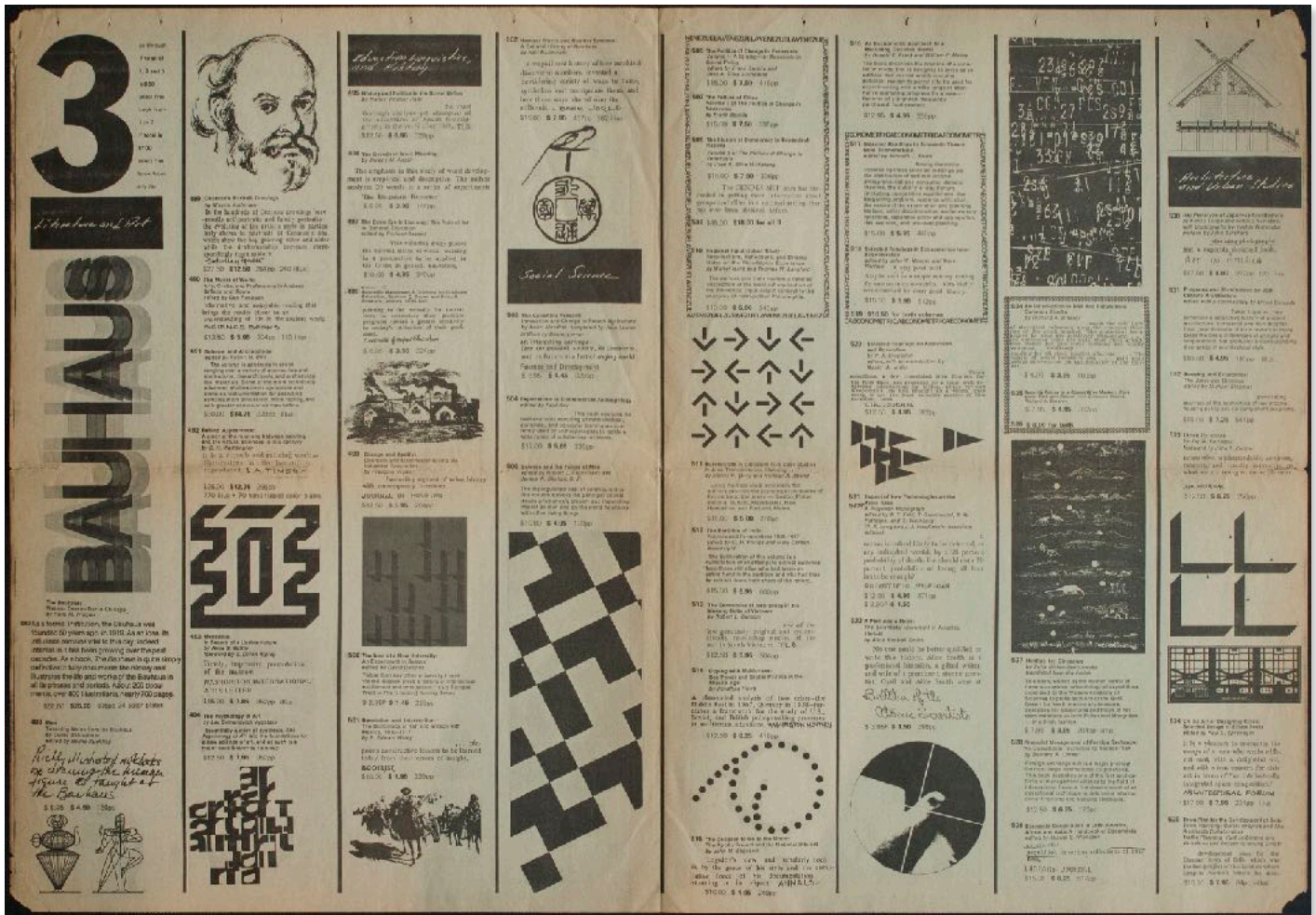
2.18 Denise Scott Brown and Muriel Cooper, Annotations of first edition of *Learning from Las Vegas*



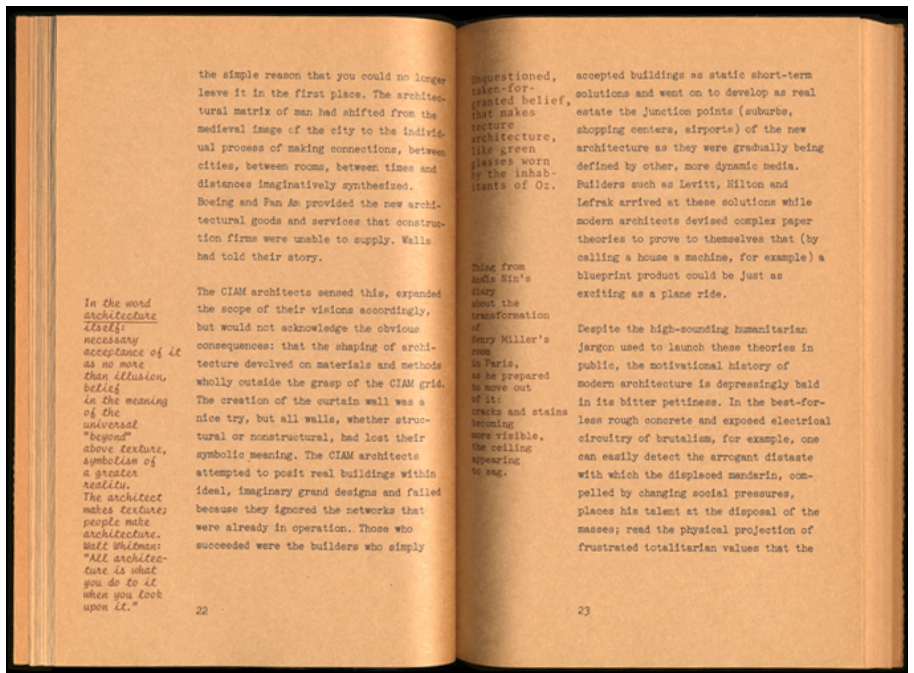
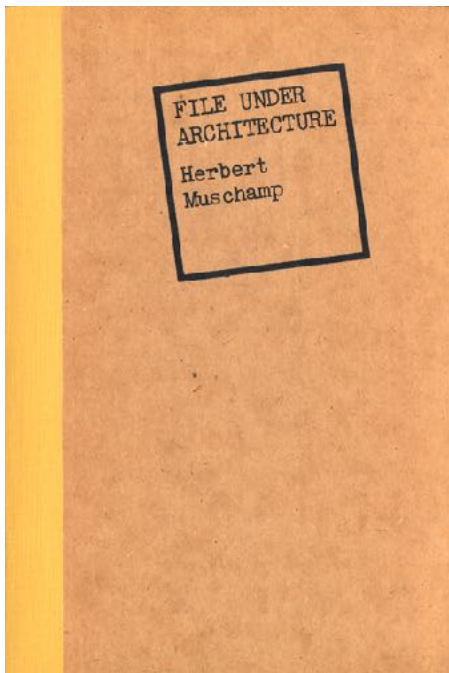
2.19 Revised edition of *Learning from Las Vegas*, MIT Press, 1977 (cover and spread)



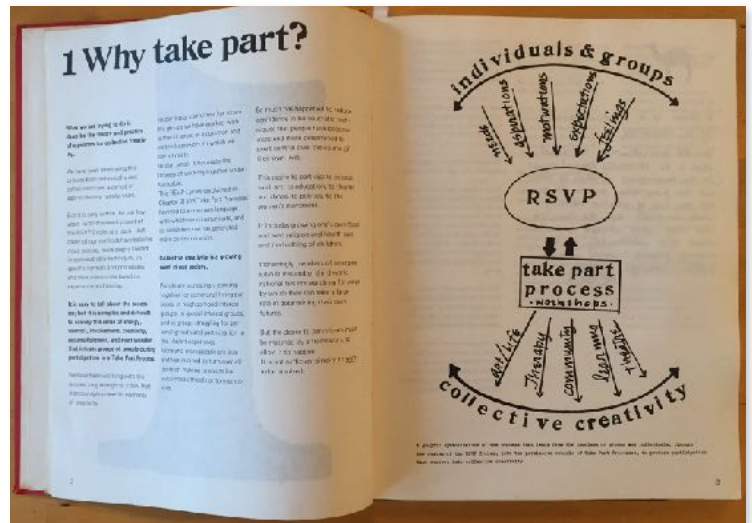
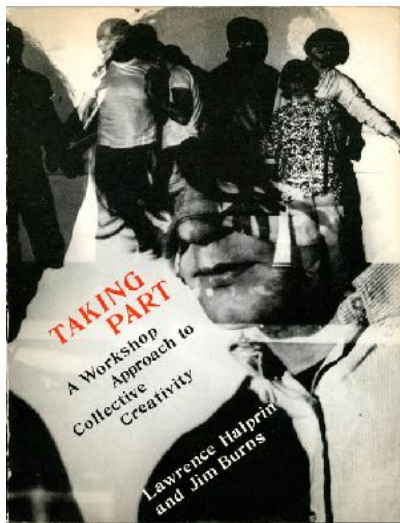
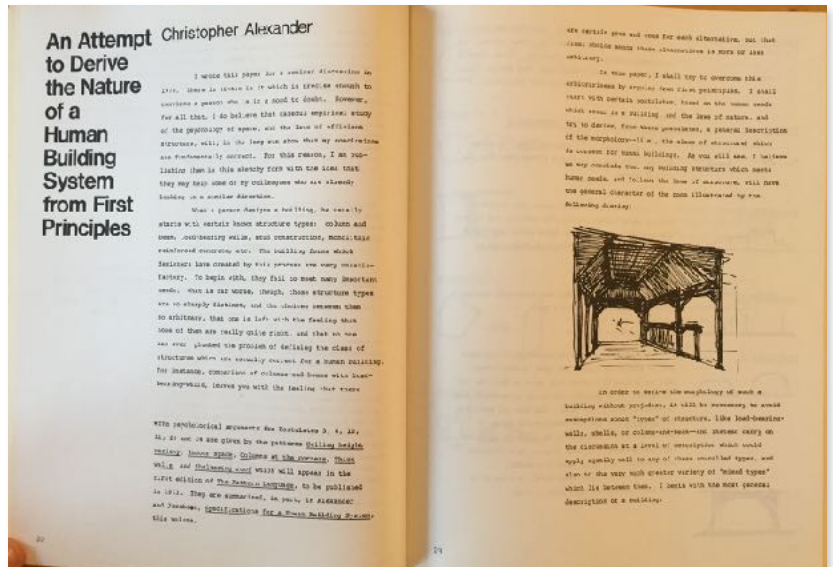
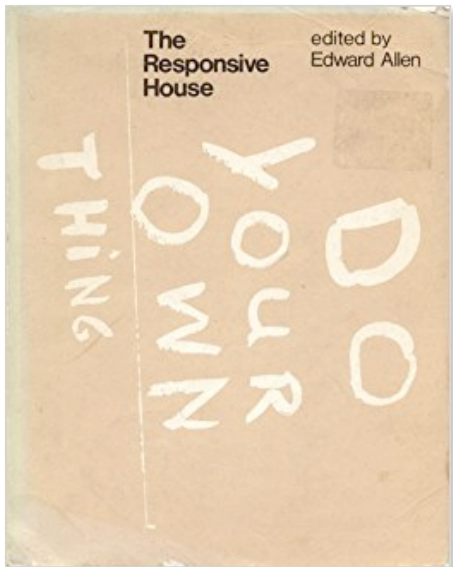
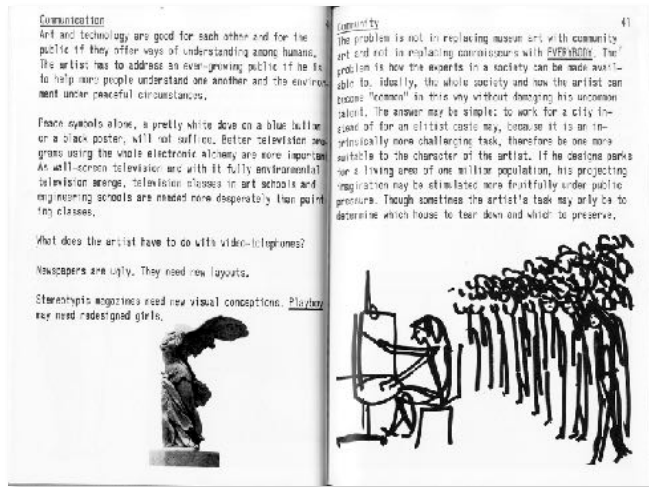
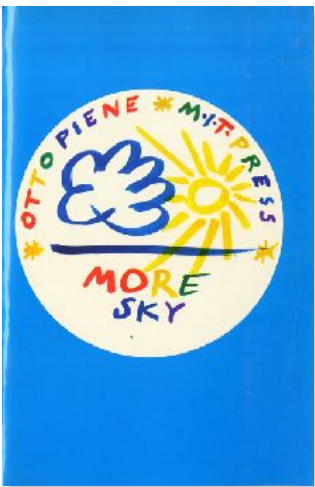
2.20 Office of Venturi and Rauch, Preliminary layouts for *Learning from Las Vegas*, c. 1971



2.21 MIT Press catalog in the style of *The Whole Earth Catalog*, 1974



2.22 Herbert Muschamp, *File under Architecture*, 1974 (cover and spread)



2.23 Otto Piene, *More Sky*, 1973 (cover and spread)

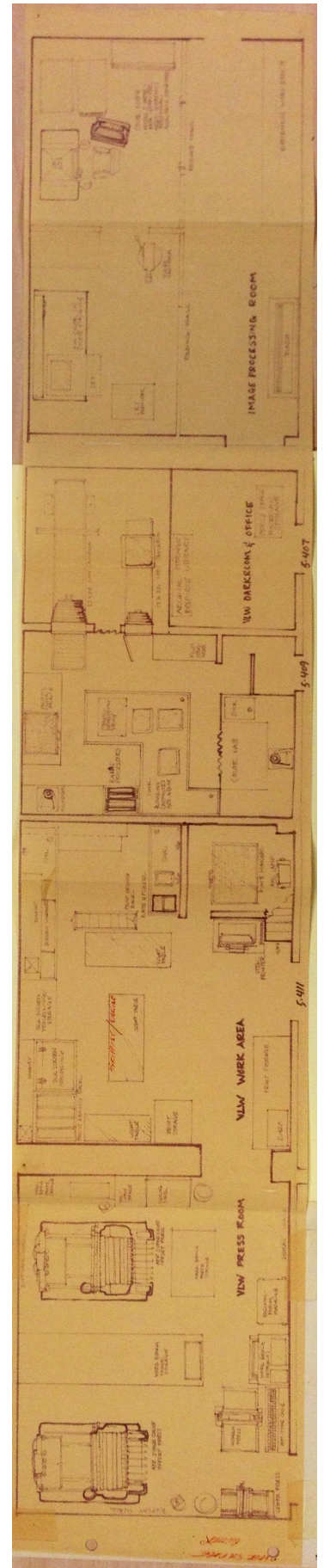
2.24 Edward Allen, ed., *The Responsive House*, 1974 (cover and spread)

2.25 Lawrence Halprin and Jim Burns, *Taking Part*, 1974 (cover and spread)



3.1 Ron MacNeil, Polaroid hand print, c. 1976

3.2 VLW floorplan, MIT Building 5, c. 1976



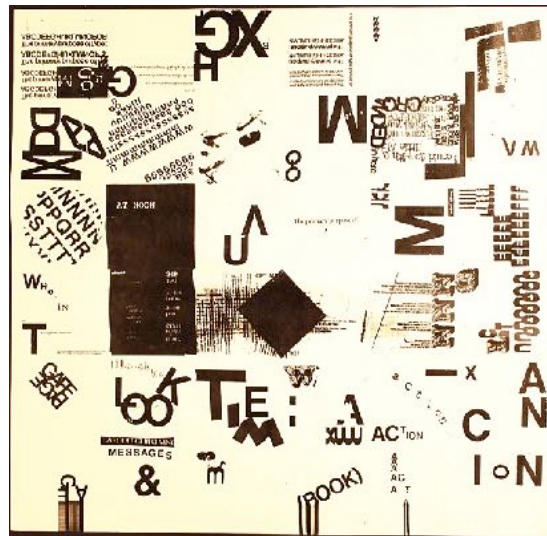


3.3 Ron MacNeil demonstrating the offset press;  
VLW students posing with press, c. 1974





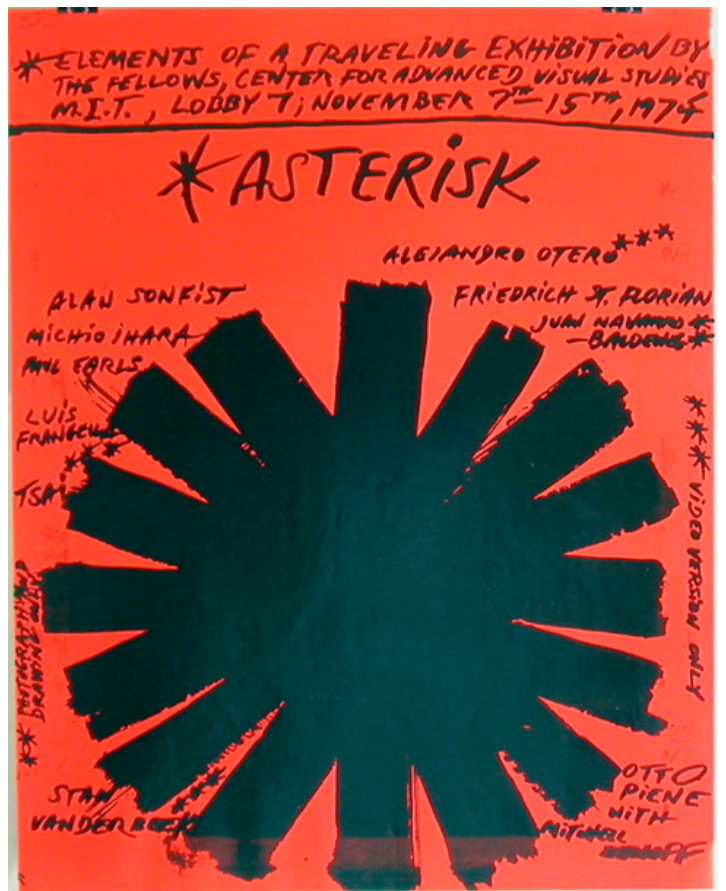
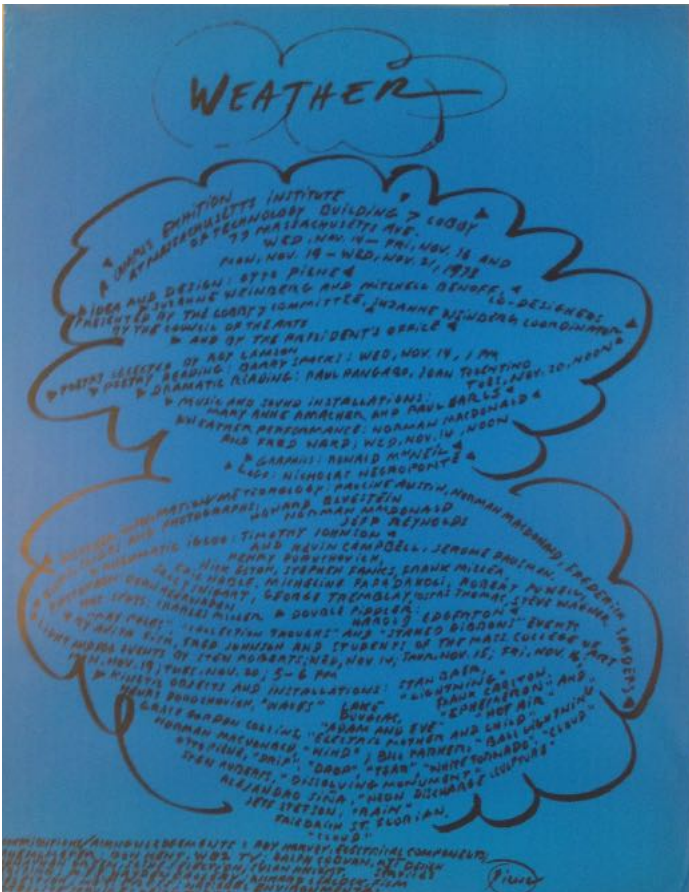
3.4 Muriel Cooper and Ron MacNeil, Messages and Means course poster, Visible Language Workshop, 1974



3.5 Messages and Means student rotation print, Visible Language Workshop, c.1974



3.6 Kurt Schwitters and Theo van Doesburg, *Kleine Dada Soirée*, 1923

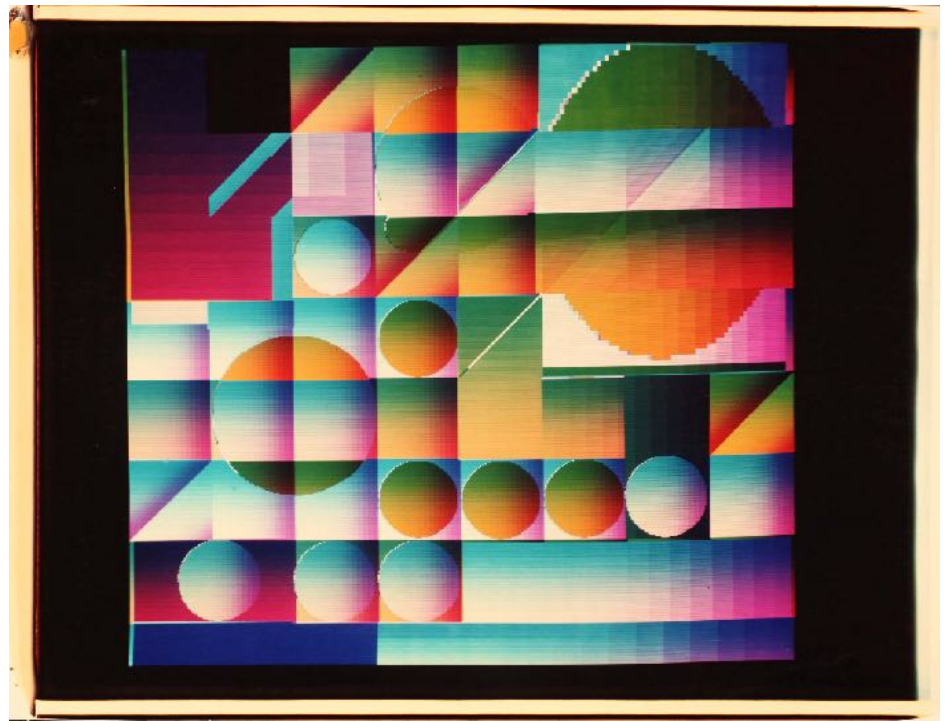


3.7 Otto Piene, *Weather* exhibition poster, 1973

3.8 Otto Piene, *Asterisk* exhibition poster, 1974



3.9 Muriel Cooper, Polaroid double self-portrait, c. 1984

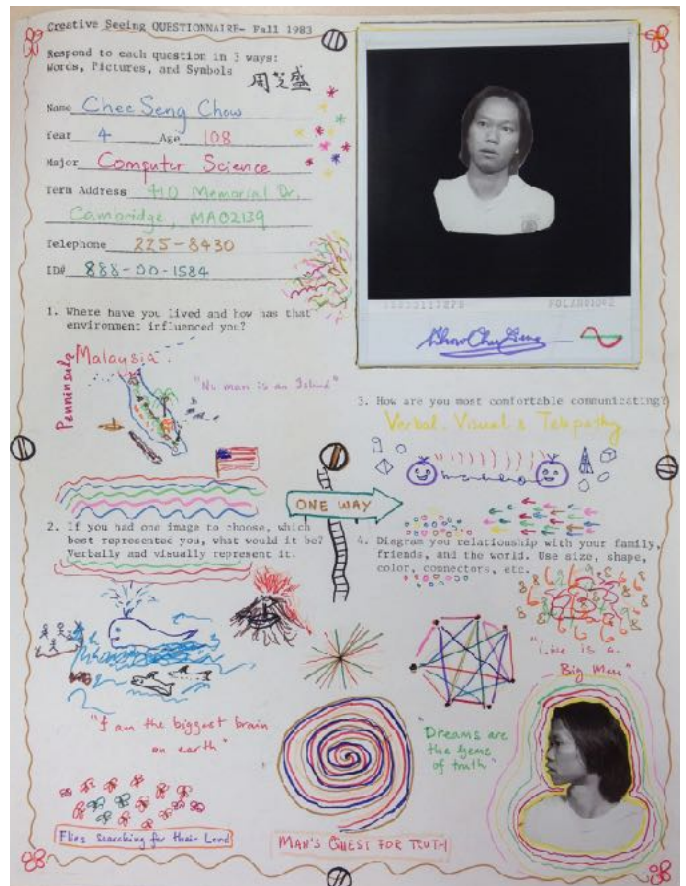


3.10 Visible Language Workshop student, large-format Polaroid print, 1980s

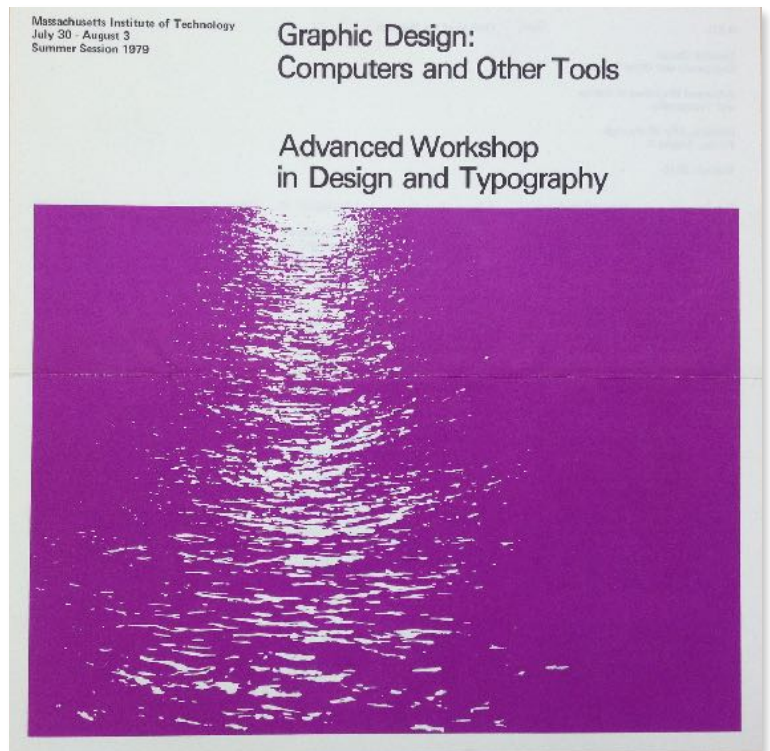
| Media Resources   | Main Hardware Source                            | Main Academic Resource                                    | Main Users & Applications  |  |
|-------------------|---|---|--|--|
| Drawing           |   | CAVS<br>Students<br>Arts Council<br>Design Studios<br>BFO | freehand drawing<br><br>freehand drawing<br>presentation drawing,<br>drawing as design tool<br>drawing as representat.<br>& analytical tool                | architecture<br>art<br>general communication<br>tool;<br>CAVS, VLW, ArchMach   |
| Photography       | Creative<br>Photo Lab                           | CPL   | technical instruction,<br>historical & personal<br>approaches, advanced<br>issues  | reproductive tool<br>scientific use<br>general communication<br>tool (f.i. documentation)<br>production step in print<br>art;<br>CAVS, CPL, VLW                        |
|                   | Visible<br>Language<br>Workshop                 | VLW   | photographic applic.<br>in print technology<br>and art, experimental<br>approaches   |  |
| Video & Film      | CAES<br>(video)<br>Film Section<br>(film&video) | FVS<br><br>CAVS   | introductions, synch-<br>sound, cinema verite,<br>history, cable issues,<br>special effects<br><br>video art   | cable TV<br>scientific use<br>general communication<br>(f.i. docum., simulation)<br>(re)presentation, art;<br>CAVS, VLW, ArchMach, FVS,<br>Planning, Political Science |
| Printed Media     | VLW   | VLW   | issues in visual commu-<br>nication & design,<br>graphic design, typo-<br>graphics, color theory &<br>photography, instruction<br>in print/related process | major and general<br>communication device,<br>here specifically for<br>planning & architecture;<br>art   |
| Computer Graphics | Architecture<br>Machine Group                   | ArchMach  | issues in computer-<br>aided design and machine<br>intelligence  | outside users,<br>planning, design,<br>storage, analysis,<br>simulation, art;<br>ArchMach, VLW   |

P. Droege - 1978 - 1979 - 1980 - 1981 - 1982 - 1983 - 1984 - 1985 - 1986 - 1987 - 1988 - 1989 - 1990 - 1991 - 1992 - 1993 - 1994 - 1995 - 1996 - 1997 - 1998 - 1999 - 2000 - 2001 - 2002 - 2003 - 2004 - 2005 - 2006 - 2007 - 2008 - 2009 - 2010 - 2011 - 2012 - 2013 - 2014 - 2015 - 2016 - 2017 - 2018 - 2019 - 2020 - 2021 - 2022 - 2023 - 2024 - 2025

3.11 Peter Droege, Visible Language Workshop, Media resources table, 1978



3.12 Sample student questionnaire from Creative Seeing, 1983



3.13 Summer session brochure, "Graphic Design: Computer and Other Tools," 1979

July 15, 1980

Jeffrey L. Cruikshank  
Editor, Plan  
School of Architecture & Planning  
MIT, 7-233

Visible Language Workshop  
Room 5-411  
Massachusetts Institute of  
Technology  
Cambridge, Massachusetts  
02139



Dear Jeff:

When you asked me to prepare an article for Plan, I set myself the task of producing a "graphic" article which would represent the ideas and concerns of the Visible Language Workshop by virtue of its form as well as its content.

In a computer electronic age we see print communication as a model of changing user/maker relationships and the workshop as a place in which the content, quality and technology of communication inform each other in education, professional and research programs.

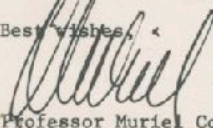
The article, "Words, Images, Tools and Ideas" would try to fulfill the following criteria:

1. It would make use of the tools, processes and technologies of graphic arts media as directly as possible and the tools would be integrated with concept and product. Many of these are in the workshop. In this case, they include a heavy use of all forms of photography and our computer graphics system for both images and typography.
2. The author would be the maker contrary to the specialization mode which makes the author of the content the author, the author of the form the designer, and the author of the craft the typographer/printer.
3. Visual and verbal representation of the ideas would be synthesized rather than separate.
4. Time would remain as fluid and immediate as possible, leaving room for feedback and change.

Much of the material was developed together with Professor Ron MacNeil and the VLW staff. It has been a fascinating opportunity which has elucidated many of the complexities of authorship into print. There is still no magic way - but we propose to keep working at it.

This stands as a sketch for the future.

Best wishes,



Professor Muriel Cooper  
Director

Visible Language Workshop  
Room 5-411  
Massachusetts Institute of  
Technology  
Cambridge, Massachusetts  
02139

*"I started" if you will for the future*

*the title*



2

Dear Jeff and Bill

When you asked me to prepare an article for the last issue of Plan that would be graphic I set myself the task of producing an article which would by virtue of its form and preparation represent the ideas and concerns of the Visible Language Workshop.

The article I hoped would fulfill the following criteria

1. It would use the tools or processes, technologies media of graphic arts namely directly as directly as possible

2. That it would bypass the normal specialized procedures of preparation for print by an author which is to provide a manuscript typewritten and some illustrations with captions to the designer who would then specify the form this material would take to the typographer and to the printer and place it in relation to the rest of the material in that sense the author of the form is the designer the author of the craft is the typographer and printer.

and thirdly that the visual and verbal representation of the ideas be synthesized rather than separated and be a representation of the changes in process resultant in them from the nature of the technologies and indeed the process itself.

that the tools be an integral part of the content

that the author be the producer in this case short of printing — copies n copies of Plan on the offset press at the VLW. this would clearly be possible but it is an off limits use of our tools.

Our move, our to building N41 and the preparation for our summer session

Well I haven't succeeded as easily as I thought I might there is as yet no magic way to print. The challenge has given me more time than any of the other authors

*usually - usually  
Use with my tools*

*keep it as close as possible with the last printed moment*

*Photography is still the primary step*

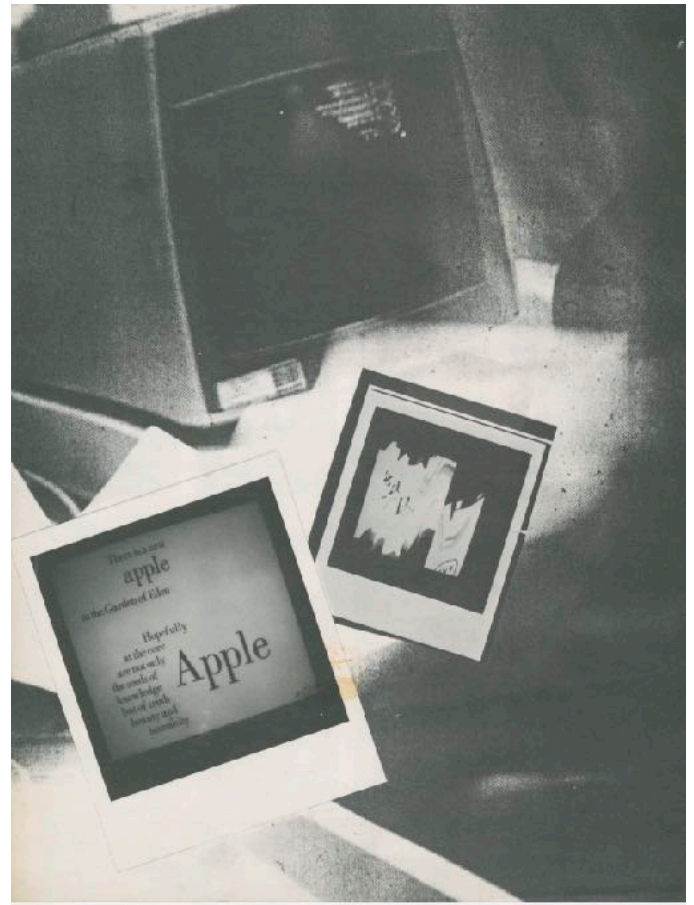
*many of these are in the right place  
"Pawnee Krazy"*

*reproduction*

*cc/Bill P*

*(2)*

3.15 Muriel Cooper, draft letter for Plan article, 1980

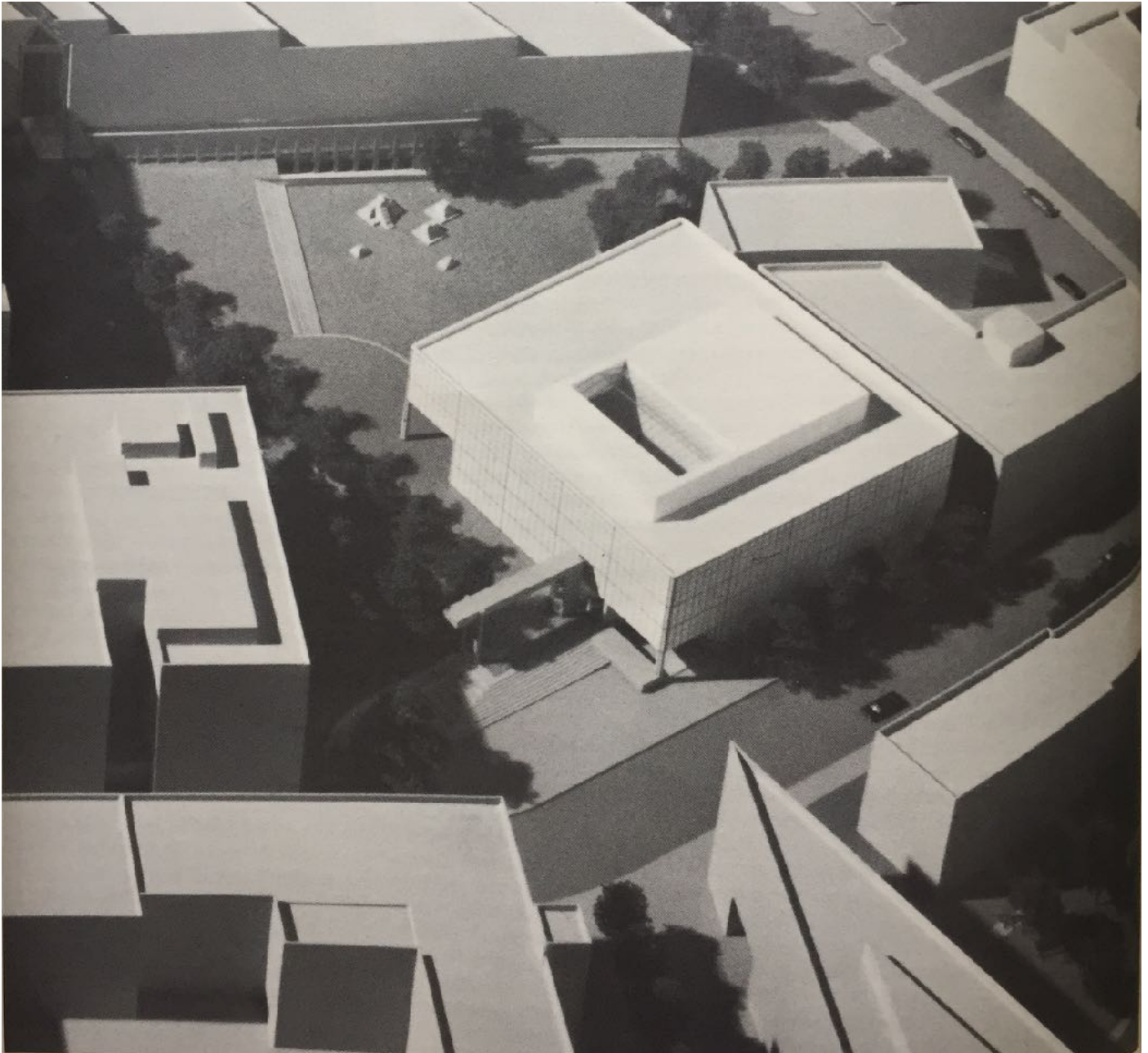
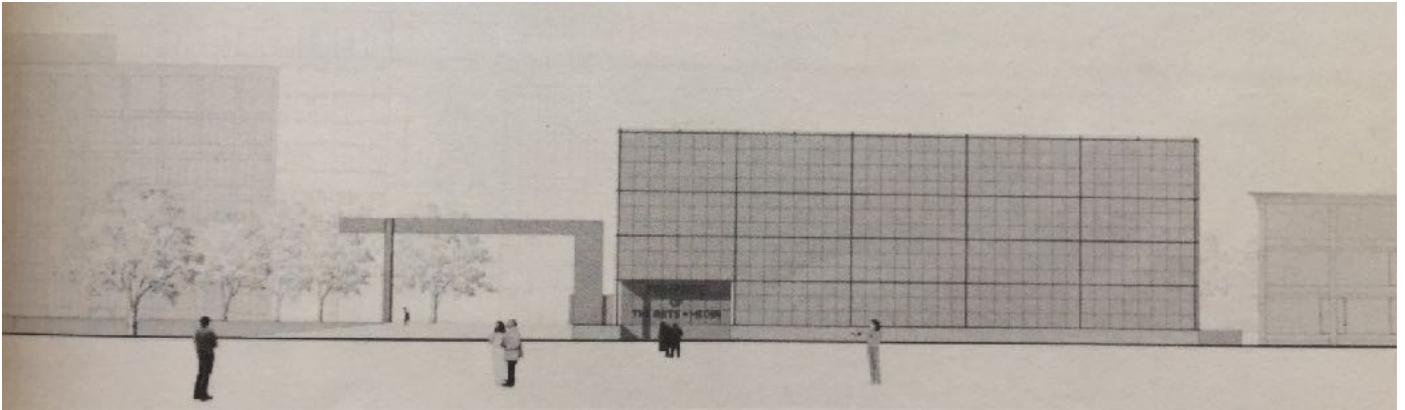


3.16 Muriel Cooper, selected pages from *Plan*, 1980



3.17 Herbert Bayer, *bauhaus* magazine, 1928 (cover)





3.18 I.M. Pei, Preliminary design for Arts and Media Technology building, MIT, 1980  
(Ames Street elevation, looking east, and model)



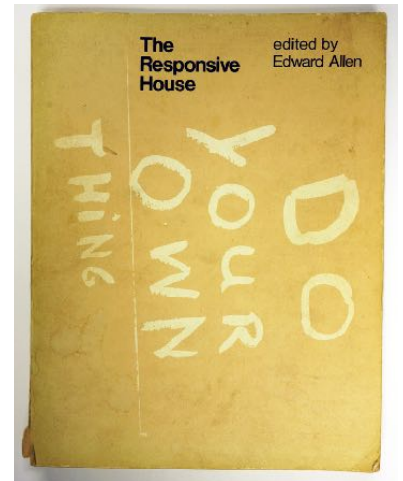
4.1 I.M. Pei, Wiesner Building (E14), looking east from Ames St., with connected new Media Lab building (E15) visible



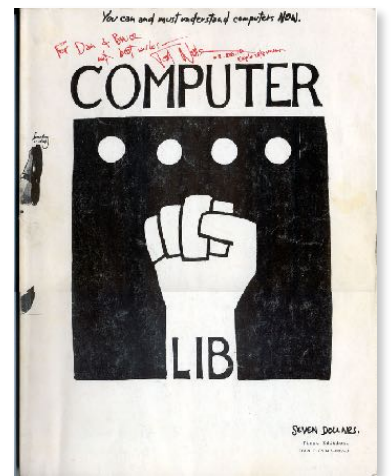
4.2 MIT Media Lab promotional laser disc, sleeve shows building atrium installation by Kenneth Noland, 1986



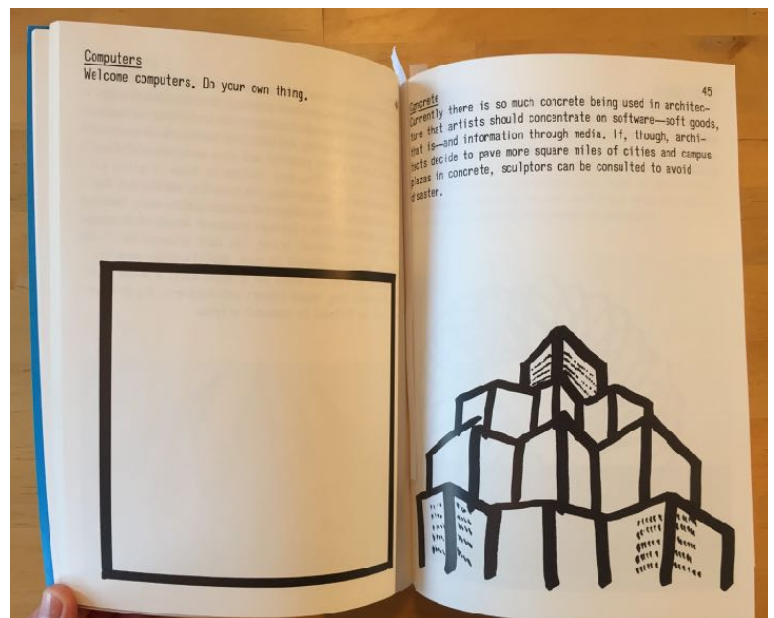
4.3 Ron MacNeil with air brush plotter, Visible Language Workshop, c. 1981



4.5 Edward Allen, ed., *The Responsive House*, 1974 (cover)



4.4 Ted Nelson, *Computer Lib/Dream Machines*, 1974 (cover)

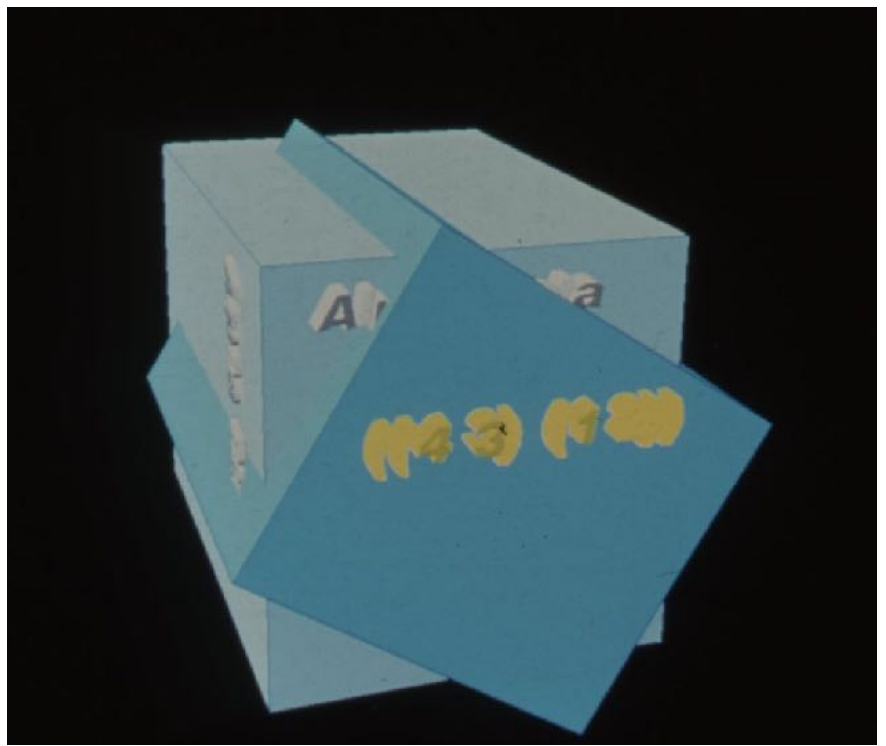


4.6 Otto Piene, *More Sky*, 1974 (spread)

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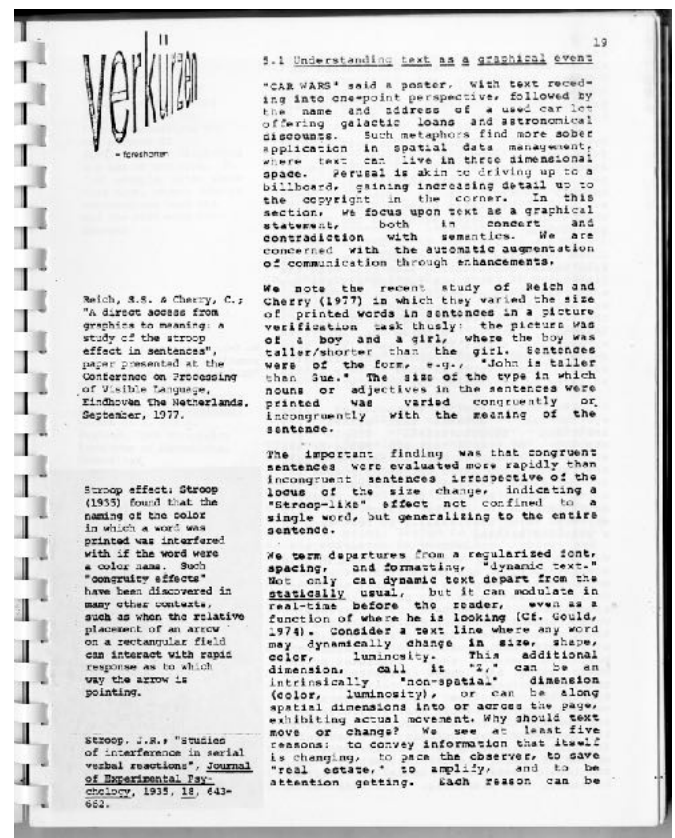
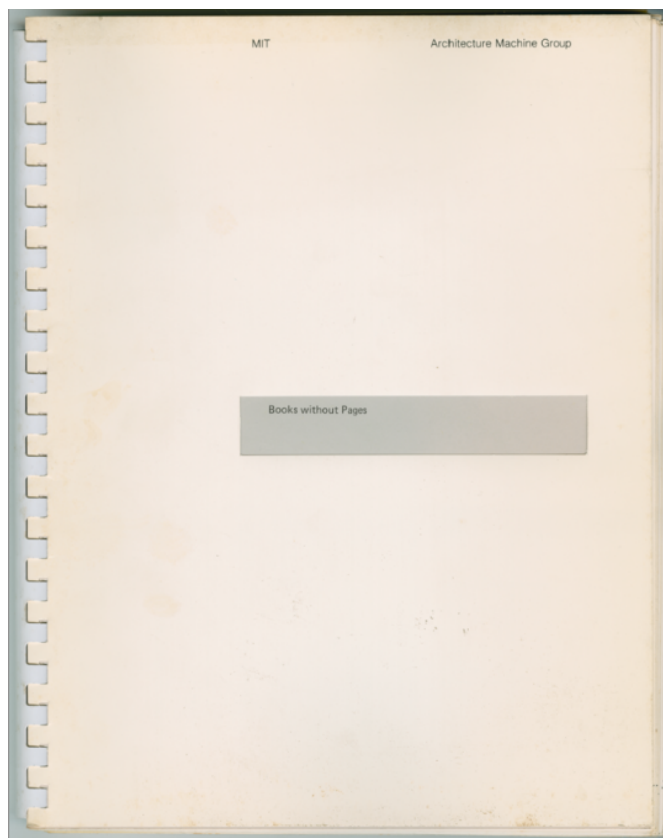
4.7 ASCII self-portrait of Donis Dondis and Muriel Cooper, 1967



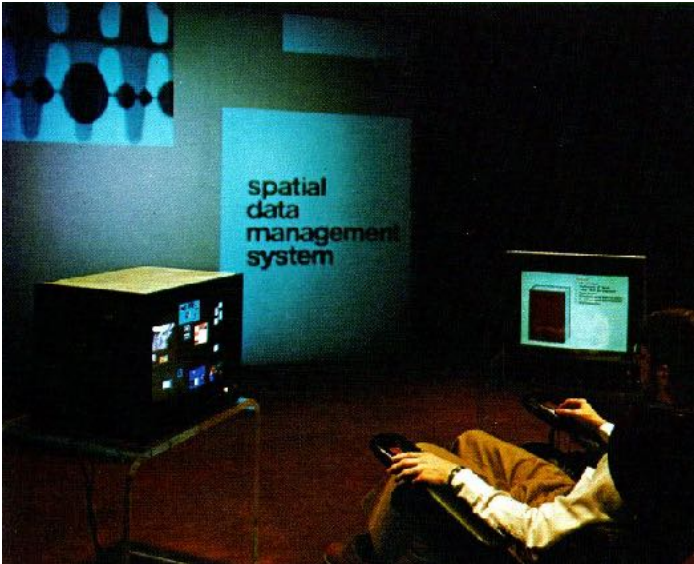
4.8 Henry Lieberman, 3D programming representation, c. 1991



4.9 Software (catalog), The Jewish Museum, 1970



4.10 Architecture Machine Group, MIT, *Books without Pages* proposal, 1978 (cover and selected page)



4.11 Richard Bolt, *Spatial Data Management System* (demonstration photography), 1977



4.12 Muriel Cooper at three-screen workstation, c. 1989



Research Topics  
at the  
Visible Language Workshop

Media Lab, MIT  
Cambridge MA

supported by  
Dr.-Ing. Rudolph Hell, GmbH  
Hell Graphic Systems, Inc.  
IBM Corp.

© VLM/MIT, 1986

New  
Graphics  
NEWGRAPHICS



...ing the reporters Sunday, said Reagan is  
lead." He refused to discuss the content of  
then stressed: "We support President Aquino  
cies of economic, political and military rel  
people them- selves to determine their future  
this regard." In Manila, President Corason  
portedly refusing to back Marcos' challenge  
to reporters at the presidential palace, ex  
ruler's appeals to Filipinos. On Sunday, Ma  
exile to 12,000 supporters massed in a Man  
leave Monday for the island of Bali. They  
Pacific to the Indonesian resort island. E  
his way to the Far East, telephoned the ex  
od wishes. Marcos indicated he would like  
a senior U.S. official said. Reagan's con

NewsDesk | Manila, April 23, 1986

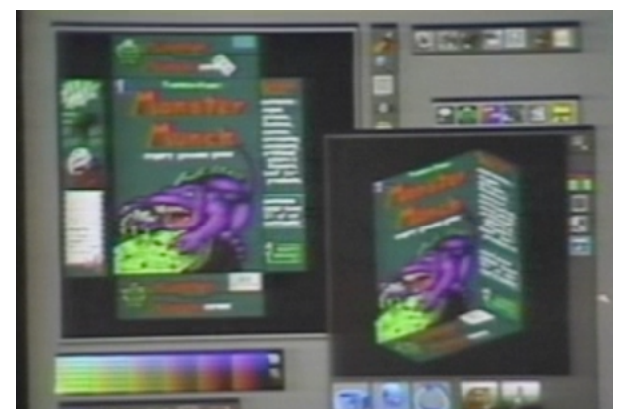
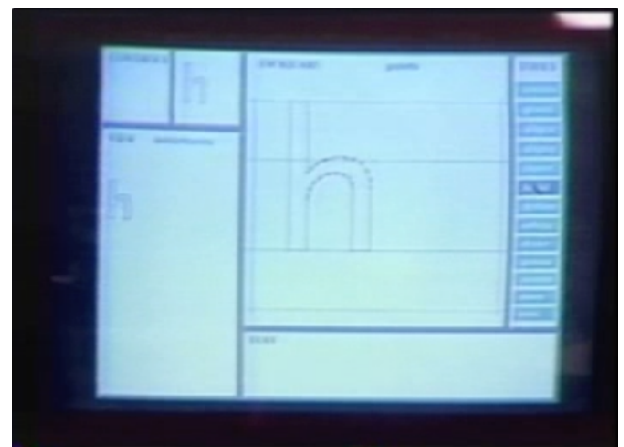
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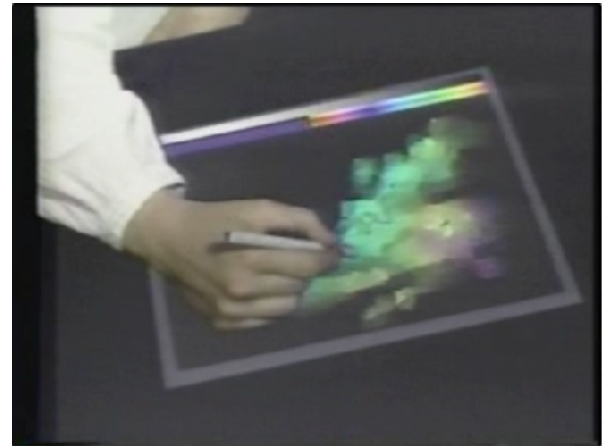
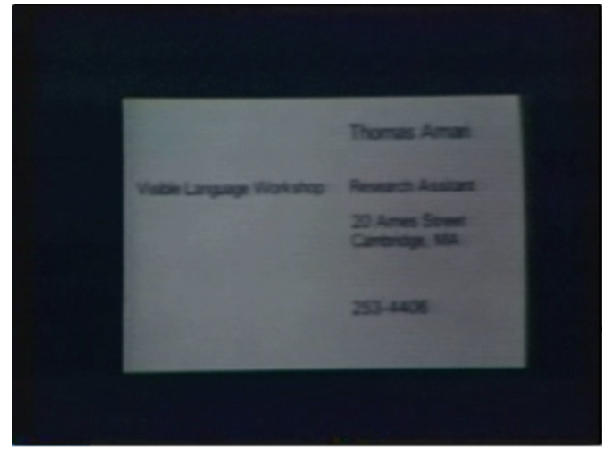
**Marcos Warns the Old Job Back; Reagan Backs Aquino Government**

MANILA (UPI) - The U.S. is offering to support for the outgoing Philippine government of President Corason Aquino. President Reagan made a courtesy phone call to Ferdinand Marcos Sunday. The report was reportedly passed to him by getting his old job back. A U.S. official said Reagan "said nothing to encourage Marcos."

In Manila, President Corason Aquino Sunday thanked Reagan for reportedly offering to back Marcos' challenge to his government. Aquino, speaking to

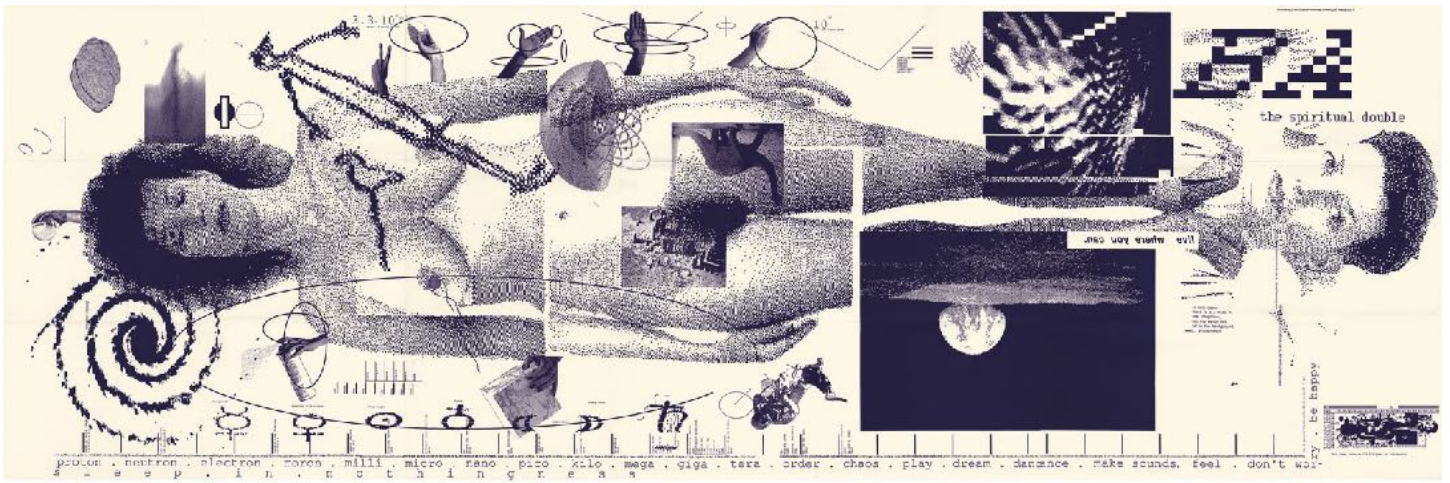
...ing the reporters Sunday, said Reagan is lead." He refused to discuss the content of then stressed: "We support President Aquino cies of economic, political and military rel people them- selves to determine their future this regard." In Manila, President Corason portedly refusing to back Marcos' challenge to reporters at the presidential palace, ex ruler's appeals to Filipinos. On Sunday, Ma exile to 12,000 supporters massed in a Man leave Monday for the island of Bali. They Pacific to the Indonesian resort island. E his way to the Far East, telephoned the ex od wishes. Marcos indicated he would like a senior U.S. official said. Reagan's con







4.13 Visible Language Workshop, "Research Topics at the Visible Language Workshop," 1986 (video stills)



4.14 April Greiman, fold-out poster, "Does It Make Sense?" *Design Quarterly*, issue 133, 1986

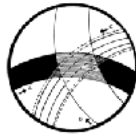
Muriel Cooper Computers and Design

The New Graphic Languages

Massachusetts Institute of Technology Media Laboratory

Visual Language Workshop

Luigi Mohl's research showing his proposed "televisions" in which a reading action occurs in front of a computer screen...



In 1982-833 MurielMap enabled the dynamic of the city...



Luigi Mohl's research showing the dynamic of the human in space...

designer's actions, using a systemic procedural representation...

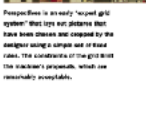


Tom Medford is investigating methods of designing one-dimensional complex graphics...

Additional information graphics are rich in the history and methods of information design...



Zeng Zeng Research: Important work in laboratories around the world contributes to the next generation of graphics and visual computers...

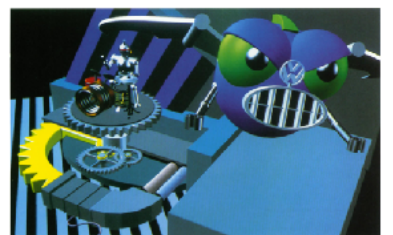


Perspectives is an early "wired grid system" that lets an artist...



The 1986 'OUCH' exhibition is an amazing and remarkable collection of illustrations...

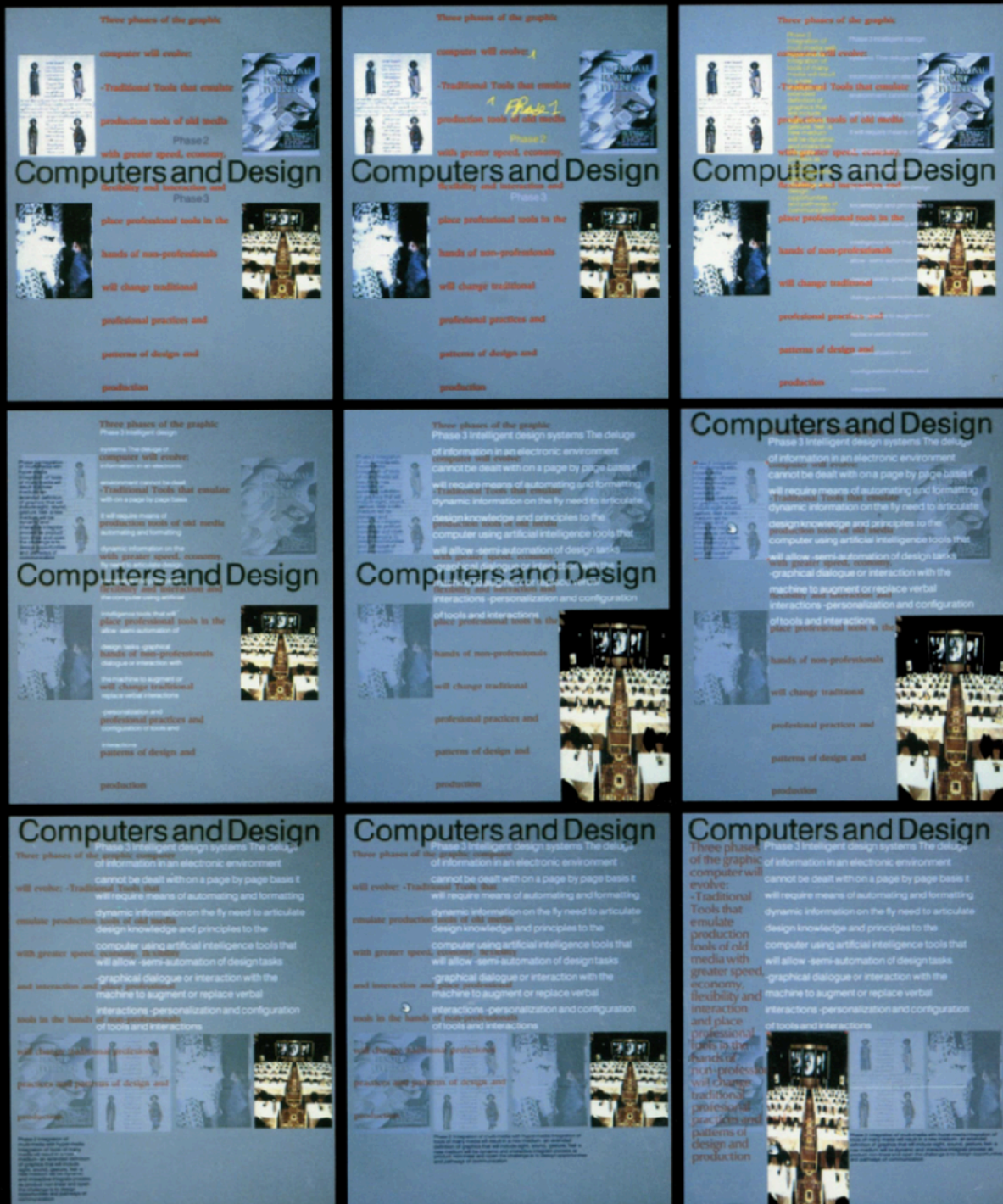
Form and Color: A slide or page with a dark background, a yellow triangle, and text discussing form and color in design.



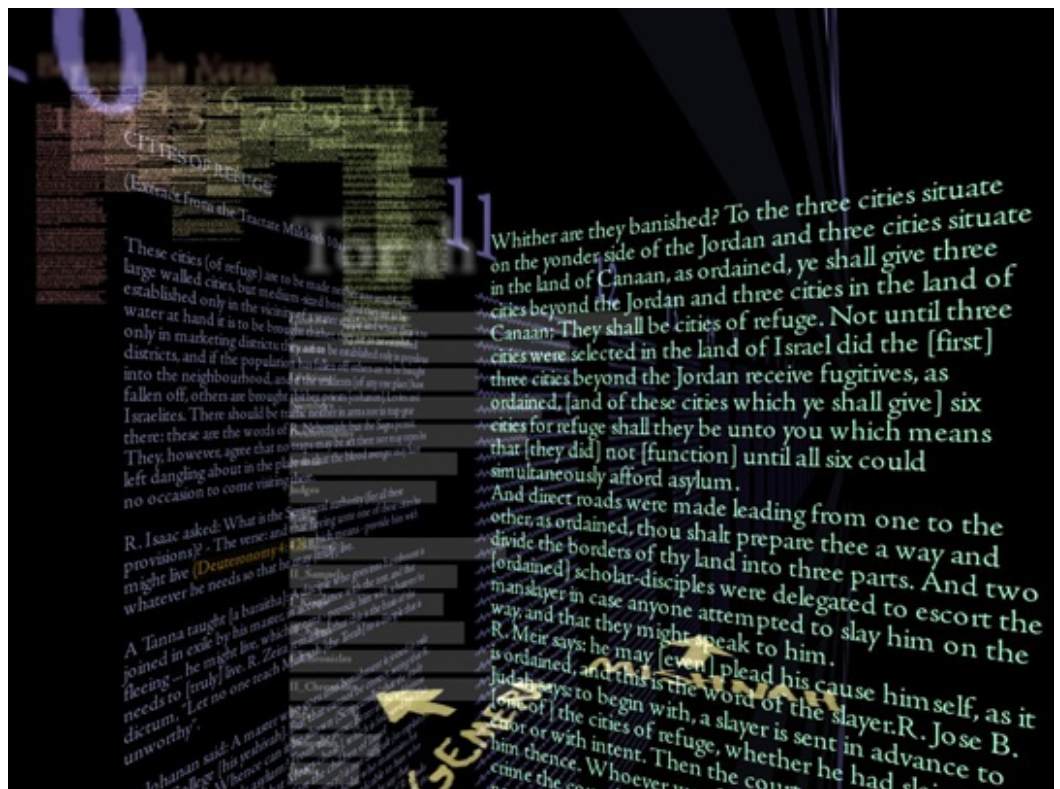
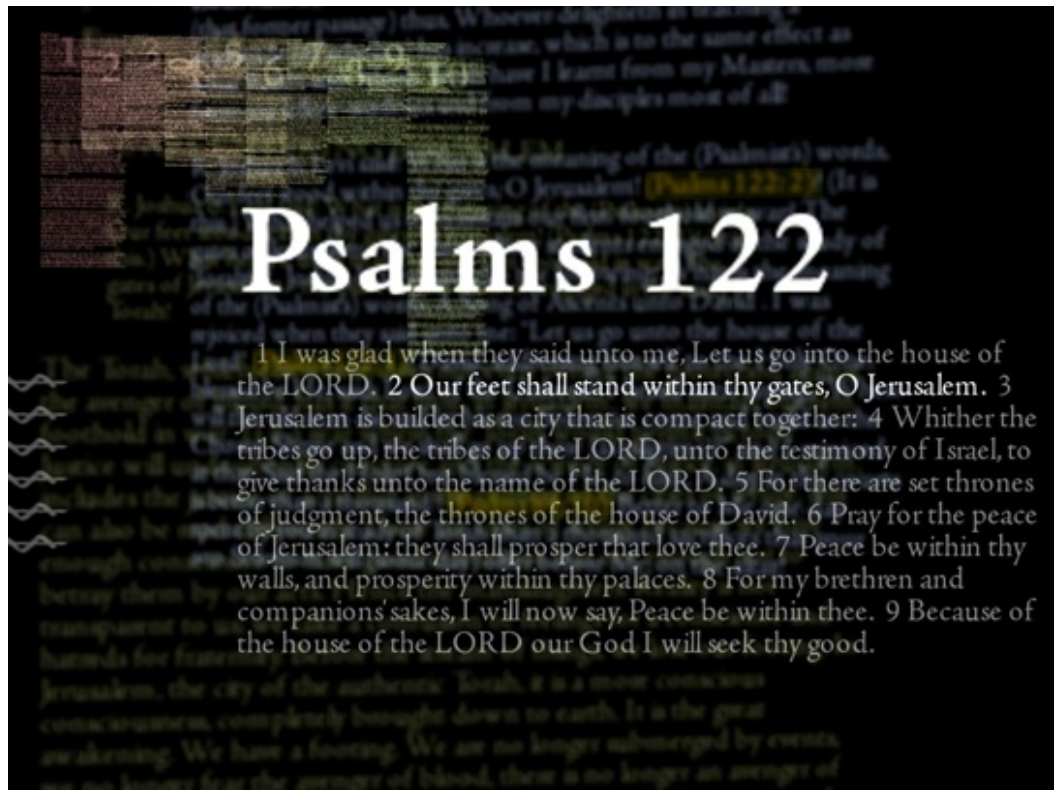
Two animated frames—fly by and the coffee-mug-shaped box that spin...



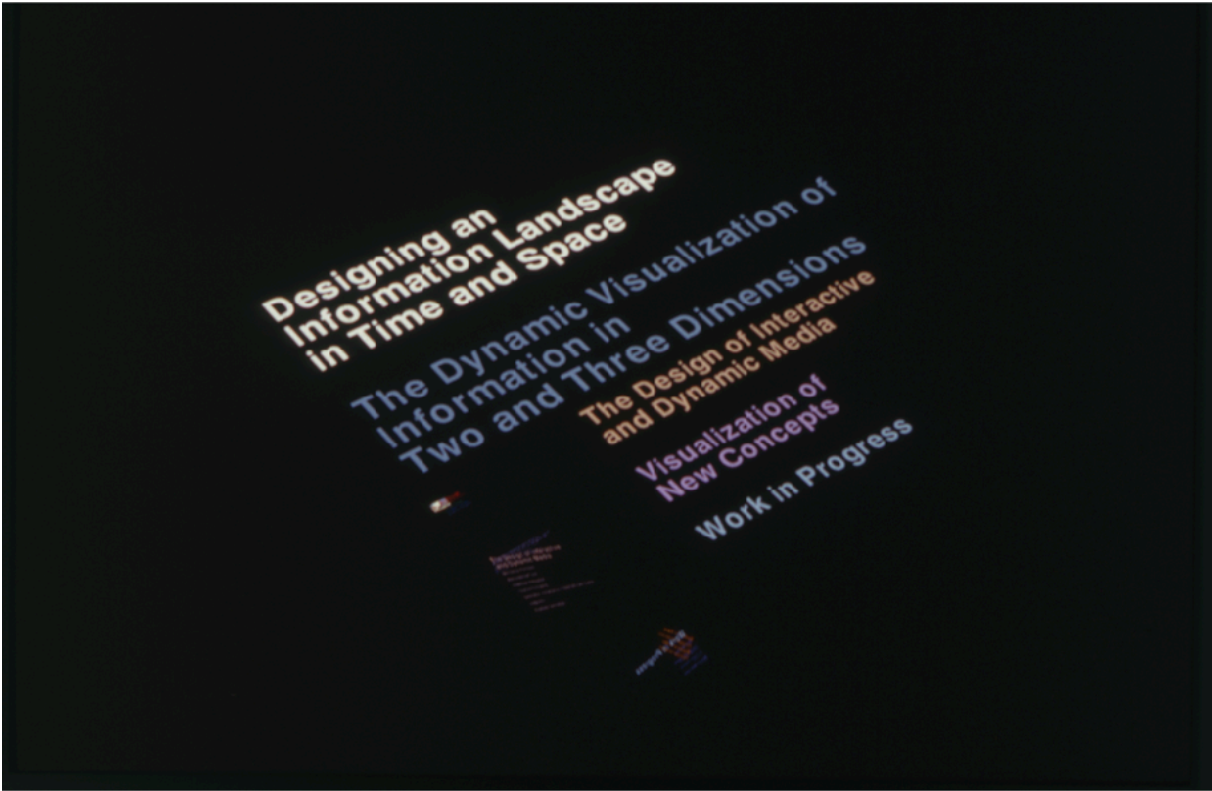
4.15 Muriel Cooper, "Computers and Design," Design Quarterly, issue 142, 1989 (selected pages)



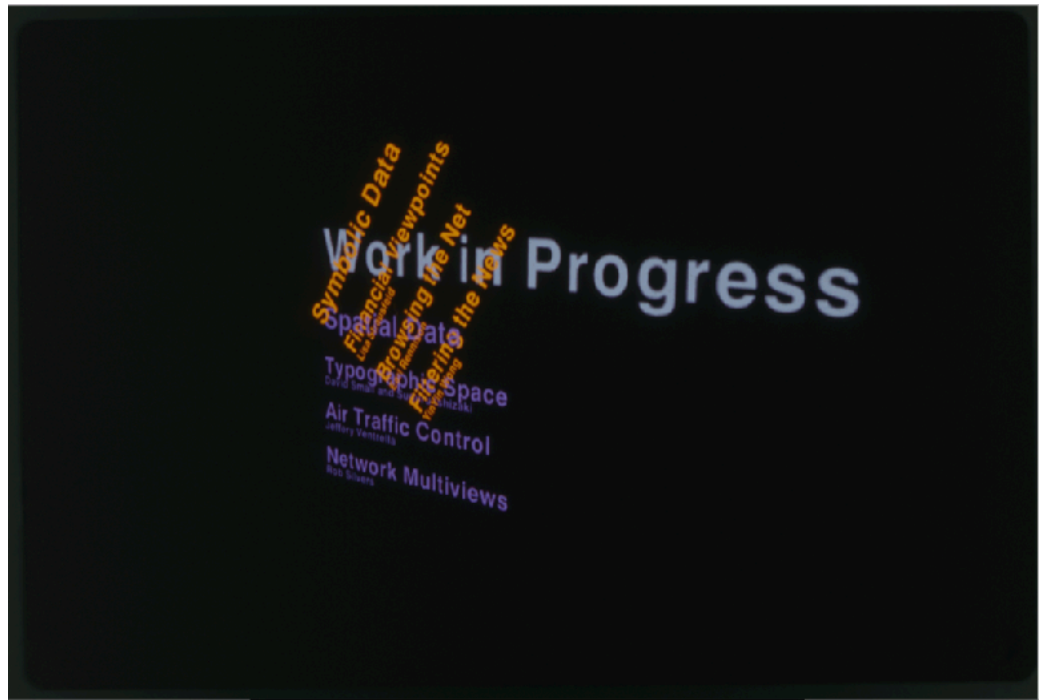
4.16 Muriel Cooper and Suguru Ishizaki, "Computers and Design," *Design Quarterly*, issue 142, 1989 (cover)



4.17 David Small, stills from *The Talmud Project*, 1998–99







4.18 Muriel Cooper, David Small, Suguru Ishizaki, Earl Rennison, and Lisa Strausfeld, *Information Landscapes*, 1994 (video stills)



4.19 Muriel Cooper in conversation with unidentified males, c. 1972

## **Illustration Credits**

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Center for Advanced Visual Studies Special Collection, MIT Program in Art, Culture, and Technology: fig. 3.8

Muriel R. Cooper Collection, Morton R. Godine Library, Archive, Massachusetts College of Art and Design: figs. 1.1, 1.2, 1.3, 1.4 (b), 1.6, 1.10, 2.3, 2.4, 2.5, 2.7, 2.11, 2.12, 2.21, 3.1, 3.2, 3.4, 3.5, 3.9, 3.10, 4.3, 4.10, 4.19

Rare Book & Manuscript Library, Columbia University: figs. 1.12, 1.13

Venturi, Scott Brown Collection, The Architectural Archives, University of Pennsylvania: figs. 2.14, 2.15, 2.20

Visible Language Workshop Collection, MIT Museum: figs. 3.3, 3.7

Visible Language Workshop, Records of Muriel Cooper, Institute Archives and Special Collections, Massachusetts Institute of Technology: figs. 3.11, 3.12, 3.13, 3.14, 3.15, 4.7

Visible Language Workshop Archive, MIT Program in Art, Culture, and Technology: figs. 4.12, 4.13, 4.18